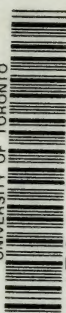



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THE INFANT
THE PARENT
AND
THE STATE

H LLEWELLYN HEATH



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THE INFANT, THE PARENT,
AND THE STATE.



PROFESSOR BUDIN HOLDING A CONSULTATION (NOVEMBER, 1906).

[Frontispiece.]

THE INFANT, THE PARENT, AND THE STATE

A SOCIAL STUDY AND REVIEW

BY

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With an Introduction by

PROFESSOR G. SIMS WOODHEAD, M.A., M.D., F.R.S. (Edin.),
Cambridge University.

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"Men agree in one thing, and that is their innate desire to enjoy the pleasure and to escape the pains of life ; and, in short, to do nothing but that which it pleases them to do, without the least reference to the welfare of the society in which they are born."—*Huxley*.

"Accuse not Nature, she hath done her part ;
Do thou but thine."—*Milton*.

"I conceive it to be demonstrable that the higher and the more complex the organisation of the social body, the more closely is the life of each member bound up with that of the whole."—*Huxley*.

TO THE READER.

THE Nation lives in its children! Canon Kingsley, in a lecture in 1859, pointed out that it is our duty to see that every child that is born shall be developed to the highest possible pitch to which we can develop him, in physical strength, in intellect, and in virtue. In this interval of forty-seven years have we done as much as we should for the infant child? No.

Since the fact of his being helpless has not gained for him the sympathetic interest he deserves, he must claim it as a citizen.

In the following pages is an attempt to bring forward facts, in a form easily assimilated, which are of moment to us, because in caring for the infant we are improving the child, and the child of to-day is the parent of the next generation.

Bound up with the interests of the infant are those of the parent, and the State has an interest in both—their interdependence is indicated in the title of these Essays: "The Infant, the Parent, and the State."

Whilst this book was in the press a great loss has been sustained in the death of Pierre Budin.

Reference is made in the following pages to his

work and to the institutions known as the "Consultations de Nourrissons," of which he founded the first, but it is with deep regret that our tribute of regard and gratitude can only be paid after his noble life is ended.

Under these sad circumstances the three photographs of Professor Budin's Clinic, taken by his kind permission for the purpose of illustrating this book, will be of the greater interest.

The best monument that can be raised to his memory, and one which would be dearest to his heart, is for each of us to take a part in the campaign which he waged so vigorously and with such splendid results.

H. LL. H.

IPSWICH,

March, 1907.

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INTRODUCTION.

ARE we as citizens doing our duty by the citizen of the future? might very well be taken as the type of question that, fortunately, is now being very widely asked in our communities. It is a question not to be lightly answered; it deserves careful consideration. Many are now trying to answer it. Some of those who have made an effort to collect materials on which to found their answer have been astonished at what has arisen out of their search, with the result that it has been driven home very forcibly that as regards the child, even before it was born and for some time after birth, conditions have grown up and have been allowed to continue which, if properly understood, would, ere this, have been got rid of at almost any cost.

Some recent attempts to improve the condition, physical, mental and moral, of the children of the poor have been described

as socialistic in their tendency. Without quarrelling about words and definitions, may it not be accepted that it is true economy to ensure healthy surroundings for the child, both before and after birth? To put it on its very lowest plane, is it "good business" to waste money on the teaching of half-starved children? to allow, unrestricted, the formation of criminals and degenerates through overcrowding, through evil surroundings, through malnutrition and through drink?

In the work before us I find evidence of an honest attempt to gather together information on these matters, to be placed at the disposal of those who are not able to collect it for themselves. In each of the eight chapters in which Dr. Heath deals with different parts of the subject we have ample evidence that not only has he studied what other people have said and done, but he has garnered much and valuable experience, facts and statistics for himself; and anyone who goes through these pages carefully and conscientiously will have a very different sense, not only of his individual, but of his communal responsibility.

Whether the author is dealing with facts and statistics as to child mortality, with those ante-natal and post-natal conditions that play such an important part in determining the welfare of the child and of the adult in after life, or whether he is writing of the milk supply, or of the agencies and organisations of importance to infant life, one is always impressed by the thorough mastery he has of his subject—where he explains, he is explaining out of the fullness of his knowledge, and where he criticises he has good grounds for his criticisms.

Some of the facts brought forward are of a most startling character, and as interesting as they are startling; as, for example, that the number of infants dying in a large provincial town in the first week of life is so great that were it to continue at the same figure for forty-two weeks every infant born alive would have succumbed within such period. And again, the striking evidence that the unborn child may suffer through the imperfect nourishment and overwork of the mother. Can nothing be done to remedy this? It appears from the statistics as though the loss to the nation in this way

may be infinitely greater than if all the women who now act as wage-earners were fully pensioned and allowed to attend to their proper duties.

On the question of the present defects of our milk supply the author speaks strongly, but not one iota too strongly, and his chapter dealing with this matter is to be heartily commended to those who take an interest in this very important matter.

Philanthropists have a tendency to become people of one idea ; but Dr. Heath, as a scientific man, as one interested in the Public Health, and as an investigator, offers food for thought to all. He indicates how important to the Public Health is each factor with which he deals, and that there is work for all, for the Educationalist, for the man interested in the housing problem, for the Temperance Reformer, and finally for the Legislator. Every man who is desirous to help his fellows may have a share in bringing about some reformation in our methods of dealing with the early and high infant mortality. How much work there is is well indicated in the quotation, "Mortality statistics show us the dead but are silent as to the maimed,"

—and what an oppressive silence it is to those who think and see!

Physical degeneration and deterioration are terms to conjure with in these days, but they raise no new problems. Let us make the most of them, however, whilst they are still potent. The Mayor of Huddersfield and his colleagues are now being taken seriously, and the question of the prevention of infant mortality has come to be one that before long will exercise more of the best minds of the country and will take its position as one of the most important with which social investigators and legislators have to deal.

This work may be commended to every parish, district, town and county councillor, to every Member of Parliament, and indeed to all interested in social problems; it will supply powder and shot to them all, just as the chapters on Health, Temperance and Thrift in Miss Eglantyne Jebb's work on "Cambridge: a brief study in Social Questions."

G. SIMS WOODHEAD.

CAMBRIDGE.

January, 1907.

THE INFANT, THE PARENT, AND THE STATE.

CHAPTER I.

INFANT AND CHILD MORTALITY.

IN the year 1904, England lost 137,392 of her children before they had reached the short span of twelve months of life.

The deaths of these infants constituted 25 per cent. of all the deaths in England and Wales during the year we are considering.¹

During the years 1900 to 1904 inclusive, 670,666 children died under one year of age, and a total of 970,749 children died before seeing their fifth birthday.

Thus, during the last five years for which complete statistics are available, nearly 1,000,000 children died in these very early years of life. We know that the two extremes of life—infancy and old age—will demand a heavier death toll than the

¹ Geneva has kept registers of births, marriages, and deaths since 1549. In the sixteenth century their infant deaths constituted 25·9 per cent. of their total deaths at all ages.

intervening periods, but a waste of this character is very distressing.

These hundreds of thousands of deaths are not alone as the evidence of child sacrifice in our midst, for the untoward influences which caused the deaths affected adversely at least three times the number among the living. This is probably under the figure, but leaving it at this, it is an unhappy reflection upon our conditions of life for three million children—to consider these years only—to bear upon or within them the evidence of having battled with inimical agencies.

The conditions that are unfavourable to the life and health of the child are very varied in kind, as also in their time of action. In one instance it may be a condition of the past though the impress is seen in a life lost to-day; in another it is a condition purely of the present with a full and immediate remedy at hand.

Professor Arthur Thomson says :—

“An organism’s start in life is vigorously determined by its parents and ancestors; not only specific characters but trivial idiosyncrasies; not only physical qualities but mental as well; not only the normal but the abnormal may be transmitted.”¹

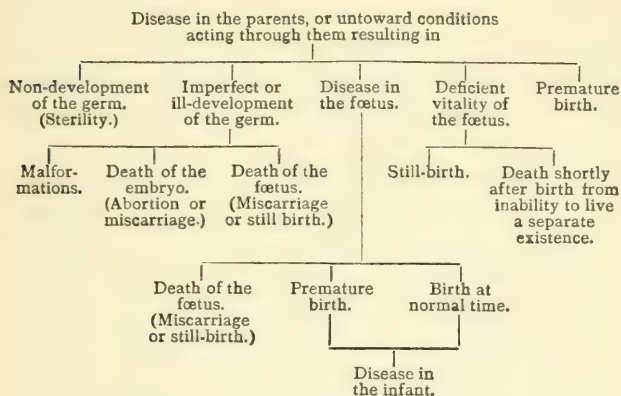
And further, to quote the teratologist, Dr. Ballantyne :—

“The individual is, as it were, the meeting-place of two long lines of spectral forms, stretching away back into the past and melting into an army of shadows each of which in its time was a living being, with

¹ “Heredity,” “Encyclopædia Medica,” vol. iv.

habits good and bad, with health or disease, with structures stoutly normal or defectively abnormal ; the infant at birth is the living ganglion towards which many lines of influence converge and in which they meet, with effects which we cannot foretell, but about which, when we see them, we say "heredity determined them."¹

The following table illustrates some of the ill results attendant upon parental influence of an adverse character.



Immaturity,² as a cause of infantile mortality, is increasing, and it is to be noticed that this change is coincident with a decline in the birth rate.

Darwin referred to the early deaths of children among certain races in the following words:

¹ "Ante-natal Pathology and Hygiene," vol ii., p. 648.

² Included in this term are : premature birth, congenital malformations, atrophy, and debility.

“This has been attributed to the neglect of the children by the women, but it is probably in large part due to innate weakness of constitution in the children in relation to the lessened fertility of their parents.”¹

The causes of immaturity may be roughly classed as being due to:—

(1) The action of certain poisons upon the reproductive cells and organs of one or both parents. These are various and are associated with alcoholic excess, lead and other metal poisoning, syphilis, tuberculosis, and other diseases. The most common are the first, second, and third.

(2) The unhealthy environment of the parents, including insanitary dwellings and workshops, injurious trades, insufficient food, excessive and prolonged work for women during pregnancy.

(3) The marriage of the unfit.

These causes, accentuated in part by others of post-natal origin, are responsible for the larger proportion of infant deaths during the first three months after birth.

The chief causes of the mortality of infants between the third and twelfth months after birth are due to:—

(1) Poverty of the parents with the attendant evils.

(2) Ignorance of parents in the feeding and care of infants.

¹ “The Extinction of Races” (Darwin).

(3) The mothers' employment in factories.

(4) Public supply of impure milk, and lack of care in the storing of it in the home.

(5) A remnant of those children whose ill development prior to birth renders them unduly susceptible in the struggle for existence.

A special sub-committee made a report through the Public Health Committee for Preston in 1902, and among their conclusions were the following:—

(1) Many deaths taking place during the first month of life, which are returned as due to premature birth, immaturity, congenital debility, and convulsions, may be ascribed to female labour in the mills.

(2) The diminished stamina of the parents is a cause especially associated with the increase in infantile mortality.

In Preston, as in the older manufacturing towns, where there is little importation of fresh blood, there is a risk in the intermarriages (often at an early age) amongst persons of the same class, and a danger of the offspring becoming more and more enfeebled.

(3) The alarming increase in the consumption by young women and mothers of alcoholic beverages exercises a baneful effect on the constitution of the child before birth, but more especially leading to carelessness and neglect of the child after birth.

The term "infantile mortality" refers to the

deaths of children under one year of age, and it is expressed as in proportion to each 1,000 births; at all ages above one year the mortality is expressed as in proportion to each 1,000 of the population.

There has been a marked decline in the general death rate of the community during the last fifty years, but the infantile mortality rate has not shared proportionately in this decline; in fact, particularly during the first trimester, the death rate of infants is more or less stationary, or even in some places shows an increase.

The rate of infantile mortality in England and Wales in 1904 was 145: this was for the whole of the first year of life.

If we divide the first year into three age periods we see the greater rate of mortality in the first three months.

INFANTILE MORTALITY RATE IN ENGLAND AND WALES, 1904.

Whole Year Rate.	0—3 Month Rate.	3—6 Month Rate.	6—12 Month Rate.
145	283	120	88

Again, if we divide the first year into yet lower age periods, we see how heavy is the death toll in the very early days after birth. The following table is based on an investigation, made by the

writer, of the ages of infants dying in a large provincial town during a recent decennium.

Age Period.	Of 100,000 born alive, there would die :
Under 2 days . .	1,432
„ 1 week . .	2,410
„ 2 weeks .	3,041
„ 3 weeks .	3,693
„ 4 weeks .	4,358
„ 2 months .	6,042
„ 3 months .	7,468
„ 4 months .	8,683
„ 5 months .	9,756
„ 6 months .	10,646
„ 7 months .	11,590
„ 8 months .	12,493
„ 9 months .	13,219
„ 10 months .	13,830
„ 11 months .	14,454
„ 12 months .	15,160

The mortality rate is so high during the first week, that were it to continue at the same figure for forty-two weeks every infant born alive would have succumbed within such period.

The mortality among male infants is greater than among female. In 1904 in England and Wales, the rate for male infants was 159, and for female 131.

Industrial centres lose a greater proportion of their children than do rural districts; this is markedly seen during the first year of life. The

higher rate is maintained throughout this period, but the excess varies greatly.

In 1904 the Lancashire infant mortality rate exceeded that of Wiltshire by 85 per cent. For infants under three months of age the excess was 38 per cent.; among those three to six months it was 137 per cent.; and among the infants aged six to twelve months it was 172 per cent.

From an analysis of the deaths of infants in the three agricultural counties of Dorset, Wilts, and Hertford, and in three counties containing great centres of industries, Durham, Lancashire, and Staffordshire, during the three years 1901-2-3, we can construct an elementary life table.

Of 100,000 children born alive, the number surviving at each age will be:—

Age Period.	Rural Group.	Urban Group.
At birth . . .	100,000	100,000
„ 3 months . .	94,644	92,300
„ 6 months . .	93,195	88,979
„ 12 months . .	90,853	84,183

We see from the above table that of 100,000 children born alive, there will die under twelve months of age, 9,147 of the rural infants and 15,817 of the urban.

An extension of the analysis showed that 13,027 of the rural and 23,693 of the urban born, failed to reach their fifth birthday.

Striking as these differences are, it must be remembered that the returns of whole counties have been considered; if we were to limit our observations to towns only, we should find the differences greatly accentuated. Thus, on the average of 1901-2-3, of the standard number of children born alive in Hanley, 18,400 would not reach twelve months of age; and in Wigan 17,810 infants out of 100,000 born alive would die during the first year of life.

Again, certain portions of towns have an infantile mortality greatly exceeding the mean. In Manchester in 1905 the twenty-two districts had among them a minimum rate of 82 and a maximum of 217 per 1,000 births.

If children's deaths are considered in relation to the districts in which they occur we see that the excess is largely due to what may be termed a "class" mortality.

In York, the three districts, Bootham, Micklegate, and Walmgate, vary greatly in their infant and child mortality.

The following facts are for 1903.

	Bootham.	Micklegate.	Walmgate.
Infant mortality per 1,000 births.	136	131	179
Deaths of children under five years of age per 1,000 living at all ages.	4'45	5'57	9'74
Premature Births and Developmental Diseases.	41	42	84

The writer is indebted to Mr. B. S. Rowntree for kindly sending him the following particulars of the Bootham and Micklegate districts. "These districts comprise a very mixed population. The best houses in York are distributed between the two, and they comprise also a good deal of shop property. In addition to this, however, they both comprise a good deal of artisan population. Possibly the proportions may approximate to the following in each district: Well-to-do, 10 to 15 per cent.; shop property, 10 per cent.; artisan dwellings, the remainder, including an undue proportion of the well-to-do artisan, the poorer artisans being in Walmgate district."

Of the greater portion of the Walmgate district we learn from Mr. Rowntree's book on "Poverty" that 69.3 per cent. of the inhabitants are living in poverty; there are many casual and unskilled workers, and, on the other hand, a number of artisans, many of whom would be living in better districts but for their unsteady habits. The district comprises some typical slum areas. Many of the yards and courts are unpaved; and brick ash-pits and midden privies, cleared only at rare intervals, abound.

Another illustration, this from Dublin. Sir Charles Cameron, the medical officer of health, arranges the mortality of the inhabitants according to the social position of the family in which the death occurs.

Class 1 is called "the professional and independent class."

Class 2 "the middle class."

Class 3 "the artisans and petty shopkeepers."

Class 4 "the general service class."

In 1903 the deaths of children under five years of age constituted 28·3 per cent. of all the deaths in Dublin.

An analysis of the census returns and of the mortality returns shows :—

	Class 1.	Class 2.	Class 3.	Class 4.
Number of living children under five years of age, expressed as a percentage of the total population at all ages in each class, at the last census.	5·4	8·5	11·0	11·1
Number of deaths of children under five years of age, expressed as a percentage of total deaths at all ages in each class in 1903.	6·2	18·8	28·6	41·4

In Croydon, Dr. Richards found that based on the returns of 1900-3, the mortality of infants among the more affluent of the population was 55, among the artisan section of the community, 156 per 1,000 births.

Certain fatal diseases are peculiarly associated with infancy. "Wasting diseases" was responsible for 45 deaths per 1,000 births in England and Wales in 1904; diarrhœal diseases, 32; meningitis and convulsions, 16; pneumonia, 12;

bronchitis, 11; tubercular diseases, 6; whooping cough, 6; and measles, 3.

“Wasting diseases” formed the cause of 56 per cent. of the deaths of infants under three months of age in this country in the year we are considering, and quite overshadows in importance the other fatal ailments.

Of the children aged three to twelve months, diarrhœa claimed a large number of victims.

Of the fatalities among children aged six to twelve months, respiratory affections—pneumonia and bronchitis—are second only to diarrhœa in their frequency, and with this, as might be expected, we find an increasing mortality from measles and whooping cough. A fatal termination to these latter diseases is not uncommonly due to exposure resulting in respiratory complications.

The following table illustrates the variations in the incidence of certain fatal diseases of infancy in rural and urban counties:—

INFANT DEATHS PER 1,000 BIRTHS, 1904.

	Wiltshire.	Lancashire.	Durham.
Total infant mortality .	95	176	160 ²
Wasting diseases . .	41	47	55
Respiratory affections ¹ .	21	38	32
Diarrhœa	10	43	27 ²
Meningitis and convulsions	8	19	22
Tubercular diseases .	2	8	8

¹ Whooping cough has been included.

² According to the 1901 census, in Lancashire, 16·7, and in Durham, 4·7 per cent. of the married or widowed women were engaged in occupations.

Being in great measure a preventable disease, it is very unsatisfactory to see the large part that diarrhœa plays in swelling our infantile mortality returns, and its greater frequency of late years.

This is well seen in the following table :—

AVERAGE DEATHS FROM DIARRHŒA PER 1,000 BIRTHS.

Group of Counties.	Males.			Females.		
	1873-77.	1899-1903.	1904.	1873-77.	1899-1903.	1904.
Urban .	22	36	39	19	31	35
Rural .	11	18	18	9	14	16

We see a great increase in the cases of fatal diarrhœa in both groups of counties, but the change is more marked in the urban than in the rural counties. The increase is probably due to the greater prevalence of artificial feeding, and will be referred to later in this connection.

A lessened mortality among infants from bronchitis, meningitis, and convulsions during the last quarter of a century is to be noticed; the increase in immaturity, and the greater fatality of diarrhœa and pneumonia are in great part responsible for the somewhat stationary position of the death rate among infants.

The increase in the deaths certified as due to prematurity, congenital defects, and injury at birth is in all probability a real and not an apparent one, but the extent of this increase is

difficult to establish, because still-births are not registered in England, and it is quite possible that of late years a certain number of infant deaths are correctly returned as deaths from prematurity, etc., and are registered, which in earlier years would have been passed as still-births.

The registration of still-births, and of the occupation of mothers in all cases of child-birth would aid materially in determining more exactly the extent of immaturity, and also the association of certain conditions of life with these abnormal endings to pregnancy.

In Stockport in 1904 there were interred 119 still-born children: of these, 74 were certified by medical practitioners, 16 by midwives, and 29 were interred with no certification.

In the same year there were registered in that town 2,566 births: the proportion of still-births was therefore 46·3 per 1,000 live births. If this rate applied to the whole of England and Wales in 1904 it would mean that upwards of 44,000 lives were so lost. If to the number of still-births be added that of the abortions and miscarriages which annually occur, with what a huge array of wasted pregnancies are we faced.

Thus, in brief review we have considered the chief causes of the deaths of infants, and we have seen that for each disease there is a higher case mortality in urban than rural areas.

Further, we have seen that excessive infantile

and child mortality is a class symptom, that the lower the social scale in which the parents live the greater is the proportion of deaths among their young. Such conditions are not inevitable and the remedies are known.

CHAPTER II.

THE INFANT.

THE long period of helplessness which characterises infancy is an interval of human life which teems with possibilities. Within it we may modify much that is faulty, yet ignorance and carelessness may also controvert the normal and produce the abnormal.

It is not sufficiently appreciated that although birth is not the beginning but the continuance of life, nevertheless, it is a radical change for the infant when he ceases to be a dependent and has to rely upon his own organs for the assimilation of nutriment.

We may fairly consider the early weeks after birth as a probationary period, a prelude to future vigour or weakness, and the infant during this time demands extreme care. The infant of to-day must have greater care shown for his welfare than has been the custom of the past, for the decline of the birth rate makes each infant life the more valuable to the nation.

We do not here make any analysis of the causes of this decline, and refer to it only for the purpose of pointing out that the seriousness of it lies, not only in the actual decline and the significance of

the causes, but also in the absence of a commensurate saving of life amongst the infants to neutralise this lack of births.

And if it were this only that we advanced as the reason for attempting a greater saving of infant life, it is sufficient to justify whole-hearted work; but further, the remedial measures we may adopt for the saving of life will also prevent the incidence of many of the ailments and diseases of children which, to-day, strain the resources of hospitals and charitable societies.

The infant is a "bundle of potentialities," a body with unknown and unseen conditions of, and for, good or ill health.

By the time of birth forces acting prior to this have done their best or worst, and all that we can now do is to encourage the former results or to modify the latter as far as human science and art are able.

It might be thought unnecessary to point out the importance of ensuring attention to the infant at birth, yet there is a great lack of care at this time.¹ To instance this in one particular, we are told that nearly one-half of the children in blind schools are suffering from loss of sight as a sequel to ophthalmia of the new-born, a disease which can be easily prevented or treated.²

¹ During the second quarter, 1906, 41 per cent. of the births in Glasgow were attended by "women of whose training one knows nothing" (Dr. Chalmers).

² Evidence "Inter-departmental Committee on Physical Deterioration," Q. 829.

Of late years there has been an increasing tendency for the infant to be deprived of its natural food—the mother's milk. This is to an extent wilful, but in part owing to physical inability, and again in part due—in industrial districts—to the factory employment of married women.

Dr. Hall, of Leeds, considers that more than 80 per cent. of English mothers do not suckle their infants.¹

Dr. Holt says, "Among the well-to-do classes in New York and its suburbs, of those who have earnestly and intelligently attempted to nurse, not more than 25 per cent. have been able to continue satisfactorily for as long as three months. An intellectual city mother who is able to nurse her child successfully for the entire first year is almost a phenomenon. Among the poorer classes in our cities a marked decline in nursing ability is also seen, although not yet to the same degree as in the higher social scale."²

There is no doubt that many women who do not, could nurse their babies. Thus the writer is told by M. Morel de Villiers it was found at the "Goutte de Lait" in Dijon that 70 per cent. of the children brought there between June, 1904, and January, 1905, were artificially fed. Recognising the law of nature that a mother should feed her infant, voluntary lady helpers visited the

¹ *British Medical Journal*, 1905, vol. ii. p. 932.

² "Diseases of Infancy and Childhood," Holt, p. 165.

homes of these mothers, gave advice, and appealed to the best feelings of the women, and the result was that with an increasing number of children attending the "Goutte de Lait" in the succeeding seven months only 48·9 per cent. were fed artificially.

Encouraging results have attended the efforts of MM. Blin et Blin at their works in Elbeuf. Prior to April, 1904, none of their married workwomen fed their infants at the breast. The employers then announced their intention of depositing in the savings bank 100 francs for each of their *employées* who would nurse her infant for twelve months. In fifteen months—that is, by September, 1905—this venture resulted in 37·5 per cent. of the infants being breast-fed.

In an investigation of 1,008 infants among artisans in Ipswich, 62·8 per cent. were breast-fed and 8 per cent. partially so. Of 296 successive children in the lower working order 266 were entirely breast-fed, and of 202 amongst the better working class 134 were breast-fed.

Dr. Richards found in Croydon, in 1903, from an investigation of over 1,000 infants under six months of age in the artisan class, 58 per cent., and in 1904, 63 per cent. were entirely breast-fed.

Enquiries at lying-in hospitals reveal the fact that probably not more than 10 per cent. of the mothers *cannot* suckle their children.

This is borne out by certain continental observers, who maintain that 90 per cent. of all

mothers are capable of nursing their children, at least for the first few months.¹

In a letter to the writer a lady says: "I know many mothers among my own friends, I am sorry to say, who did not at first want to nurse their babies, but who, on being persuaded by their doctors to do so, were as reluctant to give it up as they had been to begin."

Human milk has a definite composition differing from that of the milk of domesticated animals, and is peculiarly suited to the needs of the infant.

The infant, different to the adult, requires in its food the wherewithal, not only to repair waste, but also to build up new tissue; and this need varies in degree and kind, week by week, possibly day by day. To meet this varying need there are certain chemical changes in the human milk, a refinement of variation which man cannot fully accomplish in artificial dietaries with other milk as a basis. Given a healthy mother with a good supply of satisfactory human milk no adaptation of other milks can produce the same favourable result in an infant.

If we recall the fact that the infant before birth is entirely nourished by food elements in the blood stream of the mother, elaborated into a suitable form by physiological processes, we can the better appreciate the force of the assumption that the

¹ Report read at General Assembly, Dijon, February 9th, 1905.

milk formed in the breast of that mother should be the most suitable food for her infant after birth; the best, not only because of its composition, but it is more easily digested than the milk from other sources, and its faculty of accommodating its composition to the varying needs of development and growth is a most important attribute.

We have alluded to the long period of helplessness which characterises human infancy—a condition more lengthy in time than is found with the young of the lower animals, and during this period there is no process of development of so great importance as that of the nervous system. There is “a marked increase in the size of the brain, and particularly in the extent of its surface; during the first two years of life the brain not only doubles in weight but increases marvellously in its convolutions and complexity.”¹

The white and grey matter of the nervous system contains a fat of a complex nature known as lecithin. All milks contain lecithin in small amount; but, to quote Dr. Chapin:—

“One of the great differences between woman’s milk and other milk is that the former is richer in lecithin, which forms a large part of brain and nerves. A calf, colt, or lamb is born with a fully developed nervous system, but a baby needs material for building up its nervous system, and this is found abundantly in woman’s milk.”

Dr. Holt gives an interesting comparison of the

¹ “Theory and Practice of Infant Feeding” (Dr. Chapin).

weight curves of two strong and well-nourished infants at birth, in equally good surroundings, the one fed entirely on the breast and the other fed artificially. The former weighed at birth $7\frac{1}{2}$ lbs., the latter nearly $8\frac{1}{2}$ lbs. At the second week both weighed 8 lbs., and the breast-fed baby then maintained a continuous advantage up to the twenty-second week of life, when, the mother's milk beginning to fail, a decrease in weight became noticeable, and by the twenty-sixth week both weighed the same, 18 lbs. The breast-fed baby was then weaned and its weight chart showed an irregular line until the thirty-ninth week, at which time it was $\frac{1}{2}$ lb. heavier than the artificially-fed infant; previous to the failure of the mother's milk the baby so fed was $1\frac{1}{2}$ lbs. heavier than the other.

Dr. Vildermann, of Paris, has given the results of his investigation of the weight of 197 infants aged six to twelve months, classified according to the method of feeding.

	Breast-fed.	Mixed Feeding (i.e., Breast and Artificial).	Artificially Fed.
	per cent.	per cent.	per cent.
Of average or above average weight -	57	43'5	27'6
Under average weight	43	56'4	72'4

Another investigation of his was concerned in the state of development and general

health of 188 breast-fed and 149 artificially-fed infants.

	Of the Breast-fed.	Of the Artificially-fed.
Fine children . .	60·6 per cent.	30·2 per cent.
Medium children .	32·4 "	44·3 "

Amongst the less developed infants were several suffering from affections of the digestive organs, and of these over 86 per cent. were artificially-fed.

Dr. Vildermann concludes his article, from which these tables are taken, by saying:—

"I think I have shown sufficiently the great superiority of breast-feeding, which is the more characteristic because it has been a question of poor miserable nursing mothers who live under the most deplorable hygienic conditions."

Most striking evidence of the superiority of breast-feeding was furnished at the time of the Lancashire cotton famine; the Coventry depression of 1861, and the siege of Paris. In Lancashire, during that terrible period of privation, although the general death rate was increased, there was a marked reduction in the rate of infantile mortality, because the mothers were compelled to suckle their infants. During the siege of Paris the general mortality as a result of privation increased 100 per cent., but the infantile mortality fell 40 per cent. for the same reason as in Lancashire.

As Dr. McCleary rightly observes :—

“The enormous advantages of breast-feeding are insufficiently appreciated by the public, and it is possible that the ordinary ignorant mother of the middle or upper classes, eager to fulfil her ‘social duties,’ really thinks that no harm is being done when she delivers up her baby to the bottle.”¹

In fact, the writer has not the slightest hesitation in asserting that apart from physical inability, the selfishness of mothers and those social conditions of to-day which require the mothers absenting themselves from their homes to work, the decrease in breast-feeding is entirely due to the lack of knowledge as to its great value, and many of the instances of physical inability are due to mothers not paying the necessary attention to their diet and to the condition of the breasts, both before the births of their infants and afterwards.

The common habit of taking stimulants to “make milk” is based on error. Alcoholic beverages markedly affect the composition and diminish the nutritive value of the milk.² The secretion of milk by the breast is, however, improved both in respect to quality and quantity by the mother drinking cow’s milk.

A physician to a children’s hospital recently wrote that he was deeply impressed by the number of infants brought to him with a history of the mother’s milk failing after a few weeks, and he

¹ “Infantile Mortality and Infants’ Milk Depôts,” p. 115.

² *Practitioner*, No. 448.

found that there was rarely any recognition of the necessity of suitable diet for the suckling mothers which was evidence that "the doctor or midwife attending them had not sufficiently instructed them on the point."

The sturdy Scotch teaching, that a healthy mother who can bear a child can nurse it partially or entirely, is so near the truth that we can demand a more general adoption of this life-giving, and saving, provision of Nature.

Among the poor, a great evil is sometimes met with—prolonged nursing of their infants.

Sir Lambert Ormesby says of Ireland, "I have seen women frequently nursing their babies for two years," and Sir Charles Cameron speaking of the Dublin poor draws attention to the fact that many of the mothers suckle their children until they are over a year old.

A year after the birth of the infant the mother's milk has ceased to be the proper food for the child, and the prolonged habit is also unfavourable to the mother's health.

Let us now consider how the breast-fed infants compare with those artificially-fed in regard to the incidence of disease.

In those investigations of Dr. Vildermann, to which reference has already been made, it was found that 7 per cent. of the breast-fed children were sickly, whereas 25·5 per cent. of the artificially-fed were placed in that category.

In the course of this doctor's work at the

dispensary in the Rue Saint Blaise, Paris, he found how much more resistant to general diseases were the breast-fed than the artificially-fed infants, the mortality among the latter being exactly quadruple that among the former.

An investigation by the writer of 731 breast-fed, and 144 artificially-fed infants in Ipswich, showed that 91 per 1,000 of the former died before reaching one year of age, and 340 per 1,000 of the latter.

A few family histories taken from the writer's notes may prove of interest in this connection:—

Mrs. —, wife of a labourer earning 18s. a week, had eight children, all fed artificially; four died at three, four, eight, and ten months of age from “wasting.”

Mrs. —, wife of a blacksmith, had two children, fed on cow's milk: both died, one aged three months, from “wasting,” the other, aged five months, from “consumption of the bowels.”

Mrs. —, laundress, had three children, fed on cow's milk and patent foods: all died under one year of age from “convulsions.”

Mrs. —, wife of a dock labourer, wages uncertain, has had nine children: the five earlier were fed on the breast and lived; the last four were fed on cow's milk, condensed milk, and rice water; two died from “diarrhœa” and two from “convulsions.”

Mrs. —, wife of a shoemaker, average earnings 18s., has had eleven children, all fed on milk

sop: eight died under four months of age from "wasting."

Mrs. —, wife of a boilermaker earning 18s. a week, has had five children: the first fed on the breast, and is living; the four later children were fed artificially, three died.

Mrs. —, had eleven children, all fed on cow's milk: five died from "convulsions" and "consumption of the bowels."

Mrs. —, had thirteen children, fed on cow's milk and patent foods: lost five under twelve months of age from "diarrhœa."

Mrs. —, wife of a labourer, had eleven children: six were fed on the breast and are living; five fed on undiluted cow's milk: all the latter died at ages varying from six days to thirteen weeks from "convulsions."

Mrs. —, wife of a painter, had eight children, all were breast-fed: one died under twelve months of age from "enlarged liver."

Mrs. —, wife of a whitesmith, had eight children, all breast-fed: lost one, aged three months, from "teething."

Mrs. —, wife of a small shopkeeper, had fourteen children, all breast-fed for at least six months: did not lose any under twelve months of age, but one, aged fifteen months, died from "convulsions."

Mrs. —, wife of a general carter, had eleven children, all breast-fed: no deaths.

Mrs. —, wife of a cooper, had ten children,

all breast-fed: one died, aged ten months, from "measles."

Mrs. —, wife of a railway porter, had ten children, all breast-fed: one died from "diphtheria" at five years of age.

It was extremely rare to find instances, among families in the same position in life as the above, of a mother rearing all her family on artificial feeding. The majority of the histories showed one or more deaths, according to the size of the family, the predominating causes of which were "wasting," "convulsions," and "diarrhœa."

The greatest mortality was observed amongst the artificially-fed children when their diet had been condensed milk.

Of all the fatal diseases of infancy there is not one which shows more markedly the disadvantage of artificial feeding than does diarrhœa.

It was found in New York, that of 1,943 fatal attacks of diarrhœa only fifty-eight were in children fed exclusively on the breast: that is, 3 per cent.

Dr. Howarth found, in an enquiry in Derby covering three years, that the death rate per 1,000 from diarrhœa and epidemic enteritis was 8·6 for the breast-fed, 21·6 for the mixed-fed, and 51·7 for the hand-fed infants.

In the year 1904 it was found in Stockport that 95 per cent. of the infants which died from diarrhœa were not breast-fed.

A four years' enquiry in Finsbury ascertained

the fact that 81·5 per cent. of the infants which died from epidemic diarrhœa were fed otherwise than by the breast.

In Hanley, during 1904, only 7·5 per cent. of the fatal cases of diarrhœa were breast-fed children; in Colchester, during the same year, 10 per cent.

And so evidence might be multiplied, all of which tends to our acknowledging the truth of the conclusions which Dr. Hope advanced after his enquiry of some years ago:—

(1) Infants fed solely on the breast are remarkably exempt from fatal diarrhœa, even among the low class Irish.

(2) Infants fed in whatever way with artificial food to the exclusion of breast milk are those which suffer most heavily from fatal diarrhœa.

(3) Children fed partially at the breast and partially with other kinds of food suffer to a considerable extent from fatal diarrhœa, but very much less than those who are brought up altogether by hand.¹

It is chiefly in those causes of death known as diarrhœa, debility, and wasting diseases that we appreciate the unfavourable position of the hand-fed child, but there is another disease which requires notice, consumption of the bowels—*tabes mesenterica*.

This is more commonly found in the hand-fed

¹ "Epidemic Diarrhœa." Stevenson and Murphy's "Hygiene and Public Health."

child. Very strong is the evidence of Dr. Nathan Raw :—

“Out of nearly 300 cases of *tabes mesenterica* observed during the last twelve years, I have never known one to occur in a child which has been fed strictly on the breast, the whole of them without exception having been reared on cow's milk for some considerable period.”¹

As a result of extensive investigations, this same observer is of the opinion that there is an undoubted association between the prevalence of surgical forms of tuberculosis in children and the supply of milk from tuberculous cattle,² and this must be borne in mind when considering the relative merits of natural and artificial feeding of infants.

Dr. Howarth—to whose work reference has already been made—investigating the histories of 1,626 hand-fed infants, found the mortality varied greatly with the kind of food. In the following table this observer expressed the results of his enquiry in Derby during three years.

Kind of Food.	Death-rate per 1,000 of those fed on each Food.
Milk and water	177
Condensed milk	255
Bread, rusks, oatmeal, arrowroot, corn flour, sago, tapioca, and mixed foods.	252
All patent foods	202

¹ “Human and Bovine Tuberculosis,” *British Medical Journal*, 1904, vol. ii., p. 908.

² “Human and Bovine Tuberculosis,” *British Medical Journal*, 1906, vol. ii., p. 357. Further reference to this subject is made in Chap. V., “The Milk Supply.”

The term "condensed milk" does not refer to a constant product, and the greatest variation is seen in the fat content. There are many brands which contain less than 1 per cent. of fat. Some are made from whole milk, others from skimmed milk, the latter brands should more particularly be condemned.

The brands made from whole milk vary somewhat in the fat content, but all agree in a deficiency when diluted to the required strength for use. There is an advantage which some have over others, in the absence of cane sugar, we can thus divide the condensed whole milks into two classes "sweetened" and "unsweetened" milk, the latter is to be preferred.

But in any case it is the wrong food for infants if artificial feeding is resorted to; the deficiency of fat and the excess of carbohydrates should prohibit its use, but above all the fact that it is not a "fresh" food should discredit it.

In 1904, Dr. Hope examined several samples of condensed milks sold in Liverpool, and of them he said:—"All were found to be not sterile. There is no doubt that condensed milk is a most unsatisfactory product. Bacteria are usually present and the milk which was originally condensed might have contained various products of the decomposition of bacteria. These products are masked subsequently by the large quantity of sugar present, but their irritant properties are not destroyed."¹

¹ Liverpool Health Report, 1904.

The use of condensed milk follows in many cases a failure to get satisfactory results from feeding with ordinary cow's milk, and too often the ease with which the mixture is made for use encourages its adoption.

The patent foods—although often advertised as perfect substitutes for human milk—fail in several particulars. The excess of carbohydrates in them may perhaps cause the infant so fed to become fat, but it is an unhealthy fat associated too often with nutritional disorders.

Some of these vaunted foods are simply baked wheat or oat flour. Others are not so simple in their constitution, yet quite fail to resemble the mother's milk, which is the type of diet that an infant requires.

We have considered the suggestion that the mother's milk is the proper and safest food for the infant, and we have compared, under various aspects, the breast-fed with the artificially-fed infants, and these comparisons force us to the conclusion that the latter are often less sturdy and less resistant to disease than the former.

We may now refer to the conditions which render a mother unable to nurse her offspring.

The chief of these are, (1) a faulty development of the breasts, resulting in insufficiency of milk and even total absence in some cases; and (2) the defective quality of the milk secreted.

The first-named condition is a serious one, and, although we have not statistical evidence upon it,

observers agree that an increasing number of women suffer from this structural and physiological deficiency.

It is a striking fact that this lack of development of the glandular tissue constituting the breast is markedly associated with the athletic girl. "It is certainly a matter for study by the evolutionists why so many young women of the present generation who are tall, athletic, and of marked muscular build have such a poor development of their mammary glands," says Dr. Handfield-Jones, and he asks, "does it represent Nature's protest against the aping of the male by the young women of to-day?"¹

There is a probability—if we reason by analogy—that if the women of a race wilfully check the function and the development of an organ, they may produce descendants in whom the function wanes or is lost.

This consideration increases the seriousness of the habit of some mothers who can, but do not, nurse their babies.

It is not sufficiently recognised that alcoholism plays a great part in determining the inability of a mother to nurse her child. Not only is it seen that the natural secretion of milk is often a lost function for the alcoholic mother, but this abnormality may in turn be conveyed to her daughter, and it seems also from Professor Brunge's interesting and important studies that alcoholism in the

¹ *Practitioner*, No. 448, p. 444.

father may be a potent factor in inducing a faulty development of the breast in his daughters.

Where the pursuit of pleasure, the exigencies of work, and lack of food during the pregnant period, produce disquieting effects upon the organs concerned with gestation, we can understand that a failure in the quantity or quality of the milk secreted by the breasts may be expected. We find in mothers whose excessive and persistent work during the pregnant period has resulted in abnormality of secretion, rest and appropriate diet during the latter period of pregnancy often succeed in restoring a normal supply of milk for the next child.

But it is worthy of notice that luxurious ease may be as potent in influencing the secretion of unsuitable milk, though there may not be a deficiency, as excessive or injudicious work.

Dr. Rotch gives a very good illustration of the changes that may occur in the constitution of the milk secreted by a mother under different conditions of life. The following analyses are of the milk of one woman, (1) when she was healthy but underfed, (2) after she had taken rich food and little exercise for a month, and (3) when her food and exercise were carefully regulated.

	1.	2.	3.
	Percentage.	Percentage.	Percentage.
Fat . . .	0'72	5'44	5'50
Sugar . . .	6'75	6'25	6'60
Proteids . .	2'53	4'61	2'90
Salts . . .	0'22	0'20	0'14

A product of our conditions of life is the neurotic woman; she, when a mother, often has a small supply of milk of poor quality, or, if she has sufficient milk, her emotional excesses so vary and impair its quality that the infant thrives only when weaned.

Of the factory working mother we need not speak here, as she has claimed our attention in another chapter.

But what of the underfed mother and her infant? Here is one, the mother of eleven children, the husband's wages are 18s; another, the mother of nine, her husband earns £1; a third, the mother of eight and the family income is 18s.

When the money is scarce in the home and the supply of food becomes limited, it is the mother and the child who feel the pinch the worse. The husband has to earn the money and therefore must be fed, the woman argues, and she assures us that anything will do for her. But she has a baby, and if she has milk—whatever the quality—she nurses her offspring, not so much because it is a natural course as on account of it being the cheapest.

In such a case as this, help extended to the mother before and after child-birth might save the life of an infant, or, ensure for the living one greater strength.

We are energetic—and rightly so—in prosecuting those who supply watered milk to the community, but there is many an infant of to-day

among the breast-fed who will shortly swell our incriminating returns of deaths from "marasmus," "atrophy" and "debility" because the mother's milk is of such poor quality, that not only does the child fail to thrive, but actually sinks to the grave for want of that nourishment which Nature's food should provide. Here are four illustrations:—

Mrs. A—— has to work from home half the day and no one helps her in her own house work. She has had nine children; the last four died from "debility" under six months of age; each began to lose weight after the first month. All were fed on the breast. During the last five years the husband's work has been uncertain; and at such times bread and tea with occasional "scraps" from the butcher have formed the dietary.

Mrs. D——, the wife of a labourer, work irregular, has had six children; all died between six and twelve months of age from "wasting." All were breast-fed.

Mrs. E——, the wife of a dealer, has had five children. Three died from "wasting" between three and seven months of age. All were breast-fed.

Mrs. B——, the wife of a labouring maltster (who brings home very irregular money, because of his habits), has had eight children, four died from "debility" or "wasting." All were breast-fed.

The above instances, when contrasted with the general evidence of the greater benefits derived

from breast-feeding—especially among the poor—show that where we meet with several deaths from marasmus, wasting or debility, in a family of children nursed by the mother, we must look to the unfavourable conditions of the parents' life and surroundings, which may affect the infant prior to birth, or even perhaps more particularly to the deficient quantity or quality of the milk secreted in the mother's breast.

“My baby is never satisfied,” says a mother, and in her ignorance she does not recognise the indications that her milk is either insufficient or unsuitable, and is astonished when she is told that indiscretions in diet, and her unhealthy habits affect the baby even more than herself. There is probably no ignorance so profound as is that associated with the care of infants, and no lack of knowledge attended by such disastrous results as is that of the feeding of babies. Here is an illustration. A weakly woman became a mother, her milk was secreted in small amount only, and the quality was poor. The child was weaned, and within a few weeks died from debility. The woman was in poor health a year later when she again became a mother; her milk was as deficient in amount and value as before, yet she insisted on nursing this baby because all her friends had said “if you had nursed your first baby it would have taken your weakness from you and you would have been strong.” The baby died.

The analyses of the milk of an average healthy

woman, and of an underfed woman, both nursing a baby, contrast markedly.

	Milk of an Average Healthy Woman. (Pfeiffer).	Milk of an Under-fed Woman.
	Percentage.	Percentage.
Fat	4'00	0'72
Sugar	7'00	6'75
Proteids	1'50	2'53
Salts	0'20	0'22
Water	87'30	89'78

The milk of the underfed woman within three weeks of appropriate dieting showed over 5 per cent. of fat.

From what has been shown, if we wish to get the best results with breast-feeding we must direct particular attention to those underfed mothers whose milk is insufficient or too poor to nourish the infant.

We shall see in a later chapter that the artificial feeding of infants is not necessarily associated with a heavy mortality. When it is so associated, among the working classes particularly, it is due to:—

- (1) Polluted food.
- (2) Unsuitable food.
- (3) Ignorance of the modifications of milk necessary in the substitute feeding of infants.
- (4) Use of the long-tube feeding bottle.
- (5) Inattention to the early indications that the food is not agreeing with the child.

The Pollution of the Food.—We refer elsewhere to the possible contamination of cow's milk—from disease in the cow, careless milking, dirty utensils, and the want of protection in the shop and the home. The opened tin of condensed milk in the home is often not protected from dust. The ubiquitous house fly, fresh from the garbage heap, carrying to the food its important quota of decomposing material, is probably the most deadly agent responsible for outbreaks of epidemic diarrhœa.

Ignorance of the necessary Modification of Cow's Milk.—It is not unusual for undiluted milk to be given to an infant, with consequent formation of a curd which the delicate stomach cannot digest. When modification is undertaken unintelligently it is usually practised in the simple addition of water, barley water, or lime water.

Artificial feeding requires intelligent control; and where this method of feeding is resorted to by the poor, success can only be in any sense guaranteed through the offices of a milk dispensary. The milk is then usually obtained from an unimpeachable source, the modification is suited to the child, not the child to an unnatural method of feeding.

The long-tube Feeding Bottle appeals to the working mother by its cheapness and the ease with which it can be used. It is a great temptation for a hard-worked woman to use a feeding bottle which can be placed with the baby in its cradle. But

its use is attended with most disastrous effects. The only bottle which should be allowed for infant feeding is that of a boat shape. The infant milk depôts supply the milk in a special bottle on the end of which a teat can be slipped.

Inattention to early Indications that its Food does not agree with the Infant.—It is the delay in dealing with infant ailments that so often determines their fatality. Marasmus, the scourge of underfed infants, could almost always be arrested if the early indications of under-feeding were noticed by the mothers. Gastric disorders, intestinal affections, and convulsions would not exact their heavy toll of deaths among the infants if attention were directed to the necessity of ensuring cleanliness and suitability of food. The untaught mother mistakes the restlessness of rickets for the natural discomfort of teething, and so disposes of the matter with an occasional “teething powder.”

We must also undertake that those mothers who do not nurse their children for reasons associated with ignorance shall receive instruction in these matters. It has been well said that “at the dawn of the twentieth century we have schools in which to teach all manner of things but the duties of parenthood.”

We must think that the State, social and religious institutions and societies are largely to blame for the disgraceful lack of knowledge which prevails among the mothers of to-day. Many of the parents have been trained in the ignorance of

their mothers, no protest has been made, and only the most meagre—and frequently a total absence of—attempts to dissipate such ignorance. We frequently hear of the apathy of mothers and their disinclination to avail themselves of instruction in methods bearing upon the momentous questions associated with infant and child life.

But it is not sufficiently realised that this “instruction to mothers” is usually totally inadequate, and is harmful, in that it soothes the consciences of those who should undertake these matters and who are only too ready to impute absence and want of interest to the apathy of those women who are mothers, instead of to the form of instruction—often lacking both interest and value—provided for them. To quote Dr. Smiles, “it is not enough to tell others what they are to do, but to exhibit the actual example of doing.”

The advent of the lady Health Visitor and Health Missioner has opened up a bright vista of possibilities. The results of work in this direction prove that mothers’ feelings can be touched and parents’ interest aroused.

Unfortunately, few of our local bodies have appointed such officials, but where they are working, visiting the homes before and after childbirth, instructing mothers in the care of themselves, their children and their homes, there is satisfactory evidence of their value.

From enquiries throughout England which the author has made it is seen that where

appointments of such officials have been made for a sufficient length of time to demonstrate results the verdicts in their favour are practically unanimous. One Northern town, in which the infantile mortality was excessive, appointed two lady Health Visitors in March and November, 1902, and three and a half years of their work has resulted in a reduction in the infant death rate of "about 20 per 1,000 births."

A lady writes to the author thus: "Much might be done quite unostentatiously by the people who are responsible for 'mothers' meetings' and gatherings of the kind by helping mothers to understand something about their babies. I have sometimes had to attend mothers' meetings to speak on another subject, and I have often seen mothers giving tiny babies their own tea quite unchecked by the organisers of the meeting. I have never found the mother resentful, or anything but ready to hear, when I have talked to her for a little after the meeting. How far she carried out her promises is another matter, but it would have been my business to see, if I had been a member of the district 'Mothers' Union.'"

CHAPTER III.

PARENTAGE.

THE commonest requirement of daily life is not regarded nor entered upon with greater carelessness and more want of thought than is the important contract which we know as marriage.

A physical derelict will as readily gain the sanction of church and the congratulation of man upon becoming the partner in an agreement which may later become of great moment to the community as will a man who has lived nobly and well, and who may be the founder of a race of men and women of whom the nation will be proud and by whom she will benefit.

The marriage of those who are physically, mentally, or morally deficient is producing an offspring destined to swell our mortality returns and to fill our hospitals, asylums and gaols.¹

Such an instance as this, quoted from Mr.

¹ Connecticut, Michigan, Minnesota, Kansas, Ohio, and Indiana have statutes forbidding the marriage of epileptics, imbeciles, and the feeble-minded.

Amos Butler's contribution, is not perhaps a very unusual series of occurrences. A feeble minded woman was the mother of two feeble minded girls; the one married twice and gave birth to eleven children (the history of these is incomplete) and the other had two illegitimate children, after which she married and was the mother of two feeble minded daughters named Nancy and Lou. Nancy became the third wife of a feeble minded paralytic, and was the mother of one son and three feeble minded daughters. Lou married a feeble minded man and had three daughters—one feeble minded—and two sons, one being feeble minded.

The prevention of the marriage of the feeble minded is not so difficult a problem to face as is that of the physically feeble of our population. There is much that could be said in favour of segregation for the most marked cases of the physically feeble, but many difficulties preclude the adoption of this means of reform, and we must look to a removal of such social conditions as favour physical ills, looking also to the cultivation of a national conscience and a healthy public opinion.

The birth rate varies greatly in the different counties in England and Wales.

In 1904 Sussex had the lowest, 21·5, and Monmouth the highest, 35·5 per 1,000 of the population.

The rate is higher in urban than rural districts

—when based on the total population—and this is due to:—

(1) A larger proportion of females fifteen to twenty-five years of age in the towns owing to migration from the country.

(2) A higher marriage rate.

(3) A younger age at marriage.

Calculated on the total population the urban exceeded the rural rate during the years 1870 to 1900 by 15 to 18 per cent. Expressed as a proportion per 1,000 of the female population, fifteen to forty-five years of age, the rural rate exceeded the urban by 8 to 11 per cent.

The decline in the general birth rate is a condition that must be viewed with alarm. It has been said that a decline in the fertility of a race is always associated with higher civilisation—if so, it is an optional concomitant.

Civilisation, *per se*, does not cause the decline, neither does any increase in poverty, for amongst the poorest section of the community we find the largest families. The factors that are influencing this change are of individual rather than communal origin, and may be roughly summarised as being due to a growing disregard for assuming a responsibility that can be evaded.

The English birth rate for the ten years 1871—1880 was 35·4 per 1,000 of the population; in 1905 it was 27·2.

The decline in the birth rate during a decade is variously expressed as follows :—

Method of Calculating the Decrease in the Birth rate.	Percentage Decrease based on the Average Birth rate for 1890-2 and 1900-2. ¹
In the proportion of total births to total population	6·8 per cent.
In the proportion of total births to all women aged 15—45 years	11·5 „
In the proportion of legitimate births to married women aged 15 to 45 years	10·7 „

The general decline in the birth rate is associated with an increased proportion of women aged fifteen to forty-five years in the population, but we find :—

(1) A marked decline in the marriage rate.

(2) A decline of upwards of 20 per cent. during the last three decennia in the proportion of *married* women aged fifteen to twenty-five years.

The percentage decrease in the birth rate of England and Wales during the decade 1891 to 1900 is more marked than in any other country in Europe—of which full statistics are available—with the exception of Italy only.

In our colonies, with a marked exception, we see the same startling decline in fertility. The exception is amongst the French Canadians. The

¹ The observations of these two three-year periods are at and about census years; this makes for greater exactitude. *Vide* Registrar-General's Report.

Medical Officer of Health for Montreal, in his report for 1902, classified the birth rates of different portions of that city, and we find that the birth rate amongst the Protestant community was 23·7 per 1,000, but amongst the French Canadians—the Roman Catholic community in the main—the birth rate was 43·5 per 1,000 of the population.

Referring to the French provinces in Canada, a writer says :—

“It is a land of families—fifteen quite a usual number—and the enormous development in population of the French-Canadians, contrasted with the falling birth rate in the Anglo-Saxon stock, is likely to have strange results in the future of the race.”¹

Dr. Charles Harrington, an American sanitarian, writes :—

“In our own country, among the descendants of the original colonists and earlier immigrants the same decline is most evident. Whereas in colonial times and in the earlier years of national independence, families of a dozen, fifteen and more were exceedingly common, nowadays, one of six or eight becomes a subject for comment, surprise, and even ridicule. The large families of to-day are mainly those of the more recently arrived immigrants and of their first generation.”²

Such evidence suggests that the decline may be due to artificial and purposeful and not to natural causes, and support is given to this contention by the fact that in those countries where the tenets

¹ “Canadian Life in Town and Country,” *Daily News*, July 31st, 1905.

² “Practical Hygiene” (Harrington), p. 695.

of Roman Catholicism—which forbid such artificial causes as are referred to—are most firmly rooted in the populace, a decline in fertility either does not exist or only to a slight degree.

This is hardly a chance connection ; we see it in Austria, Spain, and amongst the French Canadians. Ireland, with two-thirds of her population embracing this creed, showed during the decade 1891 to 1900 a minimal percentage decline in her birth rate, equalled in its small figure by Austria and Spain only, amidst all the countries of Europe. This is the more significant when we recollect how large a number of emigrants leave Ireland for the United States every year, the majority being at child-bearing ages.

If a decline of religious orthodoxy—using the term in its widest application, without reference to any particular creed—in a nation is associated with the growth of the social evil to which we refer, the outlook for those countries where the religious element ceases to be a part of the character of the individual is dark. We may recall the words of a prelate of the English Church, applicable to this subject though used in another connection by the speaker, “There are not many steps in the descent from a non-religious to a non-moral nation, and from a non-moral nation to a nation in ruins.”¹

The power of Greece and of Rome ceased not so much from outside conquest as from an

¹ Bishop of Carlisle, *Times*, February 12th, 1906.

intentional decline in their fertility, with a consequent lack of men, and moral and physical deterioration of the race as a whole. Before it is too late, let nations of to-day take to heart these lessons from the past.

The age at marriage obviously has a bearing upon the numerical increase of a nation.

The younger the age of those marrying, the larger is the possible number of children that may be born to them.

There is evidence that the offspring of women who were minors at the time of the child's birth show a higher rate of mortality than do those born of women at a later age.

Korosi, in an investigation of the deaths of several thousands of children in Buda-Pesth, found that 57.5 per cent. of the deaths due to "premature birth," "weak constitution," etc., occurred amongst the offspring of mothers under twenty years of age, and he demonstrated that if the mortality of the offspring of mothers twenty to thirty years of age be taken as 100, that of the offspring of those under twenty years of age was 158 from such causes.¹

In the year 1904 there were married 19,538 women under twenty years of age in this country, and 39,378 minors.

In England we have not sufficient data to justify the assumption that the younger age of

¹ "Transactions of the International Congress of Hygiene and Demography," London, 1891, vol. x.

the mothers—within limits—is of itself a predominant cause operating in the higher mortality of their offspring.

The existence of a large number of marriages of women under age in urban and industrial centres, and where also the infantile mortality is the highest, suggests that we may have here, not only age influence at work, but also the mal-influence of those same social conditions which permit the marriage of minors.

The chief of such permissive conditions is female labour in factories and workshops, when the earnings of the girl can supplement those of the boy, and are jointly sufficient to encourage them to undertake housekeeping at an earlier age than would be possible under other conditions of life. In such areas it is the factory work rather than the age of the mother which is of such moment to the health and life of the child, by its effects before, and more particularly after, birth.

The table on p. 51 refers to the year 1903. The counties are arranged according to their rate of infant mortality; that of England and Wales as a whole being taken as the mean.

The birth rates in these counties vary rather with the proportions of marriages of women under age than with the crude marriage rates. Thus Leicestershire, West Riding of Yorkshire and Durham have a similar crude marriage rate, but the relative under-age marriages are 154, 176 and 233 per 1,000 marriages at all ages, and their

birth rates are 27·8, 28·6 and 35·5 per 1,000 respectively.

The average under-age marriage rate for the first group of counties is 115 per 1,000 marriages at all ages, and the average infant mortality from "wasting diseases"¹ is 38 per 1,000 born. In the lower group of counties the average under-age

Counties.	Marriage Rate per 1,000 of the Population.	Marriages of Women under Age, expressed per 1,000 of Total Marriages.	Birth Rate per 1,000 of the Population.	Infant Mortality per 1,000 Births.
Oxfordshire . . .	14·8	111	22·9	84
Hertfordshire . . .	13·8	123	24·5	84
Wiltshire	15·1	125	24·7	85
Somerset	13·7	99	23·4	88
Shropshire	13·5	117	26·4	100
England and Wales .	15·6	152	28·4	132
Leicestershire . . .	15·4	154	27·8	134
Staffordshire . . .	16·0	192	32·6	143
Warwickshire . . .	16·7	164	30·2	144
West Riding	15·9	176	28·6	150
Nottingham	17·1	227	31·9	151
Durham	15·7	233	35·5	156

marriage rate is 191 per 1,000 marriages at all ages, and the infant mortality from "wasting diseases" is 50 per 1,000 births.

The association of a high infantile mortality with factory work of the mothers is one of the

¹ The term "wasting diseases" is used throughout as including premature birth, congenital defects, injury at birth, ateleclasis and atrophy. This is the definition adopted by the Registrar-General.

most distressing evidences of unsoundness in our present social system.

Dr. Reid has illustrated this relation in an investigation of the infantile mortality in certain towns in Staffordshire. The towns were grouped according to the proportion of the number of female factory workers, married or widowed, to the total number of women so engaged between the ages of eighteen and fifty years. Group A. included those towns where the proportion exceeded 12 per cent.; Group B. where the proportion was 6 to 12 per cent.; Group C. where the proportion was less than 6 per cent.

The varying infantile mortality (deaths per 1,000 births) was as follows :—

	1881-90.	1891-1900.	1901-4.
Group A	195	212	193
Group B	165	175	156
Group C	156	168	149

In Dundee, when 19·4 per cent. of the women employed in the mills and factories were married or widowed, the average infantile death rate was 155 per 1,000 births; when the proportion became 24 per cent. the infant mortality figure was 176.

The medical officer of health of a manufacturing town where, in 1904, the deaths from “immaturity” and “debility from birth” constituted

nearly one-half of the total infant mortality, writes thus: "It is difficult to see how these causes of death can be removed where such a high percentage of mothers work in factories," and he regrets that there is not provision to prevent factory work late in pregnancy.

From the northern towns, too, the writer hears from the medical men: "We attribute the large number of premature births to continued work in the mill during pregnancy."

To sum up the evidence we have, it may be asserted from it that the factory work of married women imperils the life and health of their offspring, owing—in some industries more than others—to the strain of the work and its late continuance during the period of pregnancy; to the early return to the factory during those days when the mother's personal care means so much to the infant; to her absence from home and the consequent necessity of entrusting the infant to a stranger, often totally incapable of undertaking such a charge, during those months of life when we find the infantile mortality so excessive.

We have definite data on which we can base our claim that excessive and prolonged work during pregnancy is detrimental to the unborn child. Of the best known are the results of the observations made by Dr. Pinard.¹

The first table illustrates the fact that a period

¹ *Gazette des Hôpitaux*, November 28th, 1895.

of rest for the mother affects the weight of the infant at birth.

	Average Weight of each Child at Birth.
The offspring of—	
500 women who worked until the time of confinement.	3,010 grammes.
500 women who had lived in the Refuge ten days prior to the confinement.	3,290 grammes.
500 women who had stayed at the Dortoir de la Clinique Baudelocque for some time before confinement.	3,366 grammes.

The following table, framed on the same observer's notes of 2,000 cases, shows that the length of the pregnant period may vary with the working of the mother.

Group A.—This comprises 1,000 women who worked until the time of confinement.

Group B.—This comprises another 1,000 women who stayed at the Refuge or Dortoir for pregnant women for a varying time prior to their confinements.

Duration of Pregnancy.	Number, of which this was the length in Group A.	Number, of which this was the length in Group B.
280 days and upwards .	482	660
270 to 280 days . .	279	214
Under 270 days . .	239	126

Apart from such observations as these now referred to, we have not any means, at present, of

accurately estimating the harmful effect of the excessive and prolonged work of the mother prior to the birth of the child, because in the registration of births and deaths the occupation of the mother is not required, excepting in the case of illegitimate children.

Occasionally we meet with clinical evidence of the value of cessation of work by the mother for a period of time previous to the confinement. Thus in six cases recently brought to the writer's notice, a period of rest, not less than two months in each case, during the later part of the period of pregnancy, enabled the mothers to have full-time and healthy children, whereas in each instance with previous offspring there had been either prematurity or early death from "debility from birth."

We are told that in MM. Schneider's works at Creusot, in Saône-et-Loire, where provision of wages has been such as will allow the mothers "to devote themselves freely to their maternal duties and mission," and to cease work at the fifth month of pregnancy, there has followed a great reduction in infantile mortality generally, and in the number of premature births in particular.

There have been many legislative efforts made to enforce rest for factory women shortly before and after childbirth. The following is a *résumé* of what has been done in this connection in Europe during the last thirty years:—

Country.	Date of Law.	Period of Abstinence from Work.	Provision as to Wages, etc., during Enforced Rest.
Switzerland.	1877	Eight weeks, of which at least six must be after the child's birth.	—
Switzerland.	1897	A longer abstinence from work before confinement (time unspecified) in certain dangerous occupations, <i>e.g.</i> , phosphorus, lead and mercury working, etc.; and from work which entails heavy lifting.	—
Hungary .	1884	Four weeks <i>after</i> confinement.	Aided by insurance.
Austria .	1885	Four weeks <i>after</i> confinement.	Medical aid and a daily subsidy equal to 60 per cent. of the daily earnings of the insured working women in the district.
Holland .	1889 and 1899	Four weeks <i>after</i> confinement.	—
Belgium .	1889	Four weeks <i>after</i> confinement.	—
England .	1891	Four weeks <i>after</i> confinement.	—
Germany .	1891	Four weeks <i>after</i> confinement if medical certificate is shown; otherwise six weeks.	Compulsory sickness insurance, giving aid for four weeks after confinement.

Country.	Date of Law.	Period of Abstinence from Work.	Provision as to Wages, etc., during Enforced Rest.
Germany .	1892	—	If requirements of Industrial Laws demand more than four weeks' rest after confinement, the law upon insurance advises aid for the longer period.

Under the German insurance laws it is now possible to insure for sick pay up to the full amount of the daily earnings, and such sick pay may be given up to twelve weeks after confinement.

Portugal .	1891	Four weeks <i>after</i> confinement.	—
Norway .	1892	Four weeks <i>after</i> confinement if medical certificate is furnished ; otherwise six weeks.	—

(Women must not engage in dangerous, unhealthy or exhausting trades during pregnancy.)

Spain .	1900	Three weeks <i>after</i> confinement.	Employer to pay wages.
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(One hour each day to be allowed—with no deduction from wages—to factory mothers to nurse their infants.)

Sweden .	1901	Four weeks <i>after</i> confinement ; less if a medical certificate is produced.	—
Denmark .	1901	Four weeks <i>after</i> confinement ; less if a medical certificate is produced.	—

A glance at these legislative provisions will show us how lightly, in the interests of the infant particularly, this important matter has been treated, and all who have had the opportunity of observing the actual working of the same are agreed that, in the majority of instances, it is characterised by extreme laxity.

It must be noticed that little attention has been given to the importance of preventing mothers working during the latter part of the pregnant period, or at harmful trades during the course of pregnancy.

Switzerland requires an absence of the mother from the factory of eight weeks duration, of which at least six must be after the birth, but a two weeks' rest prior to the confinement is not enforced.

Norway does not require an absence from work previous to the confinement, but decrees that a woman must not engage in "dangerous, unhealthy or exhausting trades" during pregnancy.

The absence of legislation in this particular direction is much regretted, for "great harm is done and suffering occasioned to the women by their remaining at work too long before confinement."

The length of enforced rest for the mother after childbirth varies from three to six weeks; the majority of countries require only four weeks abstinence, and even this provision is often evaded.

In England, the employer is penalised if he *knowingly* allows a woman to return to work under

the four weeks, but we are aware of many instances where the foreman and forewoman of factories have pressed for the return under a fortnight ; and also where the woman has wilfully misstated the date of her confinement so that she might return within the restricted period of time.

If the woman were penalised (instead of, or with the employer) for the evasion of this law, it would probably serve as a more efficient deterrent.

What should be the period of enforced abstention from work after childbirth ?

Abstention is necessary to the mother's return to normal health, and also to ensure a certain amount of maternal care for the infant during the early weeks of life.

It is difficult, in fact impossible, to fix a minimum time of abstention in the interests of the mother, because it will vary with the individual as to her previous health, the severity of her illness, and the character of the work to which she will return.

A medical certificate of fitness—not granted purely as a matter of form—to return to the factory, would be a more satisfactory requirement than any fixed term of abstention.

MM. Schneider in their great works at Creusot will not permit the return to work of their married female employées after childbirth unless a medical certificate is produced that *neither the mother nor the child's health will be impaired by it.*

We can speak more decidedly when we consider the interval in the interests of the infant. The

most fatal period of a child's life—as our mortality statistics testify—is in the early weeks. The ages of over 50 per cent. of the infants dying in England are less than three months, and a large proportion of these deaths are from causes suggesting general want of care and injudicious feeding.

The absence of the mothers at factories means that their infants are left in the care of either children or nurse women, and these latter are, too often, decrepit dames who are unable to work and least fitted to undertake such an important charge.

The evidence of a lady, who is interested in the factory workers in the Potteries, is very striking.¹

“They (the infants) are put out to be taken care of by incapable individuals. We have one woman semi-paralysed, who had four children sitting round her on a stone floor. It is a common thing to see a baby in long clothes taken out. These women have no qualifications, they cannot work in the factory now and they live that way, they are paid so little that the food the children get is very little. A crèche was tried but it did not answer, because it was said by the working people that it was taking the bread out of the mouths of the elderly people.”

The absence of the mothers at factories means that even if the infants are fed from the breast morning and night, other feeding, probably injudicious in character, is the rule for the day.

If, too, the infants are placed out in the care of

¹ Evidence, “Inter-departmental Committee on Physical Deterioration,” Qs. 9025—9031.

nurse women, it follows that these frail lives are imperilled by being carried from and to their homes in all weathers, at all times, and often without any additional clothing.

Says a North country man, whose wife worked in one of the mills for a time :—

“How can you expect to have a fine race of men and women brought up under the conditions which prevail throughout Lancashire at the present time. At half-past five in the morning the young children are taken out of their warm beds and carried in shawls to the house of a neighbour. Between eight and nine the mother comes back and suckles the baby and returns again to work ; the same thing happens at midday ; then in the evening both the parents return to their home tired with the day's work and the children are put to bed. Is it surprising that with such a strain upon the mother—the racket of the mill interposed between the care of her family—and such physical conditions for the child, infant mortality is so appallingly high, and that the vitality of those who survive is so low ?”¹

The infant requires that the mother shall remain at home for at least three months after its birth, this being the period of time in which so many lives are destroyed through want of attention, and the future health of a large number of infants injuriously affected. If circumstances permitted, this period of time would have efficiently stimulated the maternal instinct to a degree that would prevent a return to factory work. But unfortunately the permissive circumstances are frequently wanting. The small wages

¹ “Life and Labour,” *Daily News*, September 21st, 1905.

of the men, which often exist where there is much female factory labour, necessitate a monetary contribution from the wives. Where the mother is a widow, or the offspring illegitimate, we have further causes operating which require the mother to undertake some means of making a living.

Another weakness of present legislation in England is the absence of provision for ensuring monetary help during the enforced rest of the mother. The want of money during this time is an incentive to an early return, and to a continuance of work as late as possible prior to the confinement.

The position is well stated by M. Louis Frank, Dr. Keiffer, and M. Louis Maingie :—

“If a State forbids industrial work for women about to be confined and just after their confinement, it contracts at least a moral obligation towards them to secure an indemnity equal to the salary of which it deprives them.”

What has the State done towards this end? In Germany, Austria, Hungary and Spain some provision exists, in the first three countries through the medium of sick insurance, and in Spain the employer is supposed to pay full wages during three weeks abstention from work; there is some doubt as to the observance of this requirement, but “there is the fact that Spain, very much behind us in most things, is capable of putting that law on the statute book.”¹

¹ Evidence, “Inter-departmental Committee on Physical Deterioration,” Q. 3026.

It is evident, if the State requires the mother, who works in the factory, to abstain from work for a certain period, in the hope that the country may benefit by the saving of infant lives, and by the avoidance of conditions that imperil the health of the young, provision should be made to the end that other members of the family do not suffer by the loss of the mother's contribution to the family income.

This necessitates a monetary indemnity, the whole burden of which should not fall on the nation; the larger portion of the compensation should be drawn from those who benefit directly by female factory labour, that is, primarily from the employer and to a lesser degree from the female worker.

The most satisfactory solution of the problem would be the prohibition of the employment of married female labour in factories.

A lady, whose work has brought her into close contact with this question, in a private letter to the writer, says :—

“I have seen much of the best type of employers who have felt their responsibility towards their people, and their responsibility towards the nation, and I have seen what they have *made* possible. They have set all their energies against the employment of mothers, and they have established a public opinion in their district which will not tolerate the system. They have the public spirit themselves not to snatch a small profit for the moment by cheapening labour through married women. My feeling is, that if the nation can be aroused so that it says infants shall not

die, and children shall not have their futures wrecked, the contributory cause of the employment of mothers will be stopped. I would prohibit the employment of mothers at once, within two months of childbirth, and gradually raise the period of prohibition to six months. During that period I would provide compensation under a system slightly subsidised (I think) by the State, but supported certainly in the main by the employers of the women. Such a provision would kill the system which should need nothing but public spirit to kill it."

The German League of Women's Progressive Societies has petitioned the German Home Office to prohibit women's employment for two weeks before and six weeks after confinement (approximately); asking also that the present system of sick insurance shall be so extended as to create a form of maternity insurance covering loss of wages, confinement expenses, and the provision of free medical attendance for lying-in women and infants; and that all women whose income, or husband's income, is less than three thousand marks shall have a right to insure.

This prohibition of employment at such times, it is intended, should apply not only to factory workers, but also to "home workers, commercial employées, domestic and agricultural servants."¹

The last paragraph contains a section of great interest, namely, the inclusion of "home workers" amongst those who are to benefit, should such

¹ "Sociale Praxis," July 13th, 1905.

legislation be effected. The lot of the outworker is usually harder than that of the factory worker, for the latter is not sweated to the disgraceful degree as is the former. The home worker, lacking organisation, is too often paid at a rate which barely permits the provision of food to live, and certainly not to ensure health for the worker and her family. Such a scale of pay is evidenced in the following remunerations:—

Pill boxes, one shilling for 36 gross; paper bags, fourpence-halfpenny to sixpence per 1,000; match boxes (bearing on each, commercial virtue's advice, "Encourage home industries"), twopence to twopence-halfpenny per gross, the workers supplying their own paste and string; strawberry baskets, three shillings and sixpence per gross (the worker finding the wood at a cost of two shillings per gross), and it usually means two days' work to earn that one shilling and sixpence.

Such work at such pay means an endless drudgery from the early hour of the morning to the stroke of the midnight hour.

A means of dealing with these wrongs would be furnished by the provision of such a Bill as Sir Charles Dilke's Wages Boards Bill, but the growth of a public conscience among delinquent employers would remedy the evils which should not require the hand of the law to enforce their removal.

Two match-box makers, a consumptive husband and his wife, are earning twelve shillings

a week, when work is good, and this the income upon which parents and five children exist! Well may we echo the pertinent enquiry: "The children, the new generation, the rising hope, what of them?"

The Factory and Workshops Act, 1901, sect. 107, empowers the Home Secretary to specify certain industries in which the employer must, twice a year, send to the local authority a list of the outworkers employed by him.

The Home Work Order of August 15th, 1905, came into operation in January, 1906, and superseded that of 1902. In this later order several classes of work are added, such as the making of paper bags, brushes, and stuffed toys. The public health officials by this have a wider range of inspection of home work than formerly in respect to sanitary conditions and precautions; but the unlimited hours of labour and the scanty wages are the evils of greater significance in their effects upon the health of parents and of the infants, born and to be born.

The home worker has no period of rest after her confinement enforced by law; so far as the writer can judge from his own experience, it is most exceptional for her to take a month or even a fortnight of rest, and unless compelled by marked physical suffering, she works until the eve of her confinement if her earnings—as only too often—are a dire necessity.

In this lies the danger of increasing for the

factory hand the period of enforced abstention from work after childbirth ; she may, for the time being at least, become a home worker, and thus to a large extent render futile all legislative efforts on behalf of her and her child.

CHAPTER IV.

PARENTAGE (CONTINUED).

AN observer, with wide experience, speaking in very decided terms of the importance of the physical efficiency of the maternal parent, says: "Wherever robustness comes, it comes from the mother, not from the father."

Dr. Ashby says:—

"There is a large number of infants born who are weakly from the very first; their start is a bad one. Before the child's birth development has been proceeding badly on account of the ill health of the mother, and the infant comes into the world really handicapped from the very first. I do not doubt that the foetus may suffer from imperfect nutrition in consequence of maternal weakness. I feel certain that the depressing effects of the struggle for existence on the parents are transmitted to their offspring."¹

Dr. Emmett Holt writes:—

"The physical development of the child is essentially the product of the three factors—inheritance, surroundings and food."—(Holt.)²

Referring to Manchester, Dr. Niven, the Medical Officer of Health, says:—

"It is certainly a remarkable thing that the greatest improvement in children occurred in the

¹ Evidence, "Inter-departmental Committee on Physical Deterioration," Q. 8671, Q. 8912, Q. 8675.

² "Diseases of Infancy and Childhood," Holt, p. 1.

quinquennium following that in which the greatest improvement occurred in the young parents, so that it does appear as if the physique of the parents did influence the physique of the infant to some extent."

Quite as important a factor as less work for the pregnant woman is that of sufficient and suitable food for her.

There are not to be found wanting many who assert that the feeding of the pregnant woman has little effect upon the physical condition of her offspring!

A common-sense view would be that an underfed woman could not be the mother of as healthy a child as could the woman, in the same station of life, who fed judiciously and well.

Why should we expect Nature to have a total variation of her laws for man, from what she has for the lower animals? A farmer, who depends upon the physical condition of his stock as a source of income, would not succeed if his animals were as under and badly fed as are many of the mothers of the human race.

Dr. Chalmers (Glasgow), in a recent report of his district, says: "Broadly speaking, immaturity in the child results from inefficient dietary of the mother."

Dr. Paton found in his investigations that well-fed pregnant guinea pigs gave birth to young which weighed 0.35 to 0.4 gramme for each gramme of the mother's weight, whereas the young of under-fed pregnant guinea pigs weighed

only 0·22 gramme for each gramme of the mother's weight.¹

The observations of Dr. Prochownick, of Hamburg, are of importance in showing that the feeding of the pregnant woman may affect—within limits—the size of the infant at birth. These observations covered sixty-two confinements among forty-eight women.

In the previous pregnancies of these women—in each patient there was contraction of the pelvis—it had been found necessary either to induce premature labour, or to give instrumental assistance at full term.

By dieting the mother during her pregnant period, in each of these sixty-two cases it was found possible to so regulate the size of the child as to bring about a normal birth at full term.

Naturally, the mother being the only medium through which the necessary nourishment reaches the child prior to birth, unless the pregnant woman has sufficient and proper food, the unborn infant cannot receive such as is required for perfect development.

The experience of the writer in this direction bears out the following statement: "There are indications that diet may so influence the maternal and foetal tissues as to lead to the birth of a viable child, in cases where the previous obstetric

¹ "Influence of Diet in Pregnancy on the Weight of the Offspring," *Lancet*, July 4th, 1903.

history indicated the improbability of this ever taking place.”¹

It is sadly interesting to peruse the weekly budget of some of the households investigated by those interested in this subject.

A tailoress and her husband in Stepney spent their money during a certain week as follows:—

	s.	d.
Meat	1	0
Milk	0	1½
Tea	0	4½
Sugar	0	3
Bread, herrings, and salt	1	6

Another budget is for a family consisting of husband, wife and child:—

	s.	d.
Cheese	0	1
Bones for soup	0	2
Meat pieces, 1 lb.	0	3
Potatoes	0	4
Butter	0	3½
Milk	0	5
Sugar	0	4½
Cocoa and tea	0	4½
Bread	0	7
Beer	0	7

Sir Charles Cameron investigated in Dublin the daily diet of the poorest classes, and concerning this he writes:—²

“The diet is generally a very poor and not seldom a very insufficient one. The constant items are bread and tea. Butter is not always obtainable. Cocoa is

¹ “Encyclopædia Medica,” vol. ix., p. 517.

² Dublin Health Report, 1903.

pretty largely used, coffee never. Very little home-made bread is used. Beef and mutton are not often found on the tables of the poor. When they are, it is generally for the use of the bread-winner of the family. Bacon is largely used in the form of rashers, but more frequently it is boiled with cabbage. The inferior American kind is, owing to its cheapness (5d. to 6d. per lb.), mostly in use. The milk most frequently used is condensed skim milk, which is purchased at 1d. to 3d. per tin."

The following is an extract from a more extended table which this same observer included in his "Health Report," for 1903, and of it he says, "it may be regarded as showing the general nature of the *cuisine* of the poor in Dublin."

Occupation.	Wages.	Number in Family.	Breakfast.	Dinner.	Tea.
Tailor .	10s.	2	Tea and dry bread.	Herrings, dry bread, and tea.	Sometimes porridge, supper and tea combined.
Bootmaker .	18s.	6	Bread, butter and tea.	Bacon and sometimes eggs with bread and tea.	Bread, butter and tea.
Labourer .	20s.	5	Bread, butter and tea.	Bacon and vegetables.	Bread, butter and tea.
Labourer .	15s.	Husband, wife and three children.	Dry bread and tea.	Bread and bacon (occasionally). Bread and tea (occasionally).	Bread and tea, no butter.
Labourer .	16s.	Husband, wife and four children.	Tea, bread, and sometimes butter.	Fish, usually meat on Sundays.	Oatmeal "stir-about" on Sundays.
Labourer .	16s. to 18s.	Husband, wife and four children.	Bread, butter and tea for all meals; occasionally meat, or a "rasher and egg," for dinner.		

Mr. Rowntree summarises the results of a portion of his investigations in York in the following words:—

“(1) The diet of the middle classes is generally more than adequate; (2) that of the well-to-do artisan is on the whole adequate; but (3) that of the labouring class is seriously inadequate. Indeed, the labouring class receive upon the average about 25 per cent. less food than has been proved by scientific experts to be necessary for the maintenance of physical efficiency. This statement is not intended to imply that labourers and their families are chronically hungry; but that the food which they eat (although on account of its bulk it satisfies the craving of hunger) does not contain the nutrients necessary for physical efficiency.”¹

Unsuitable food is probably a more widely acting cause of physical inefficiency than is want of food. The term “self under-feeding,” suggested by a medical man, is a very apt designation for this.

The following quotation demands serious attention; the words are those of Miss Margaret Simpson, justified by her experience of working girls in Manchester and Salford:—

“From childhood the girls are used to all sorts of unsuitable food, pastry, cakes, etc., instead of nourishing food, and to taking it in snatches, probably standing at table and eating hurriedly. So they do not acquire a taste for sensible food, and get into the habit of eating irregularly and uncomfortably. The heated rooms in which they work tend to make their appetites jaded and unhealthy, so instead of making the best of the few pence they have, they buy cakes

¹ “Poverty: a Study of Town Life,” Rowntree.

and pastry, or chipped potatoes, or fried fish and pickles; anything they consider 'tasty.' It is most difficult to get the girls to eat sensible food and in really sufficient quantities, even when provided. One of the girls said that she had not tasted bread for more than a week. She takes biscuits to work for breakfast in preference to bread and butter, and so on."¹

And these unhealthy habits are carried on to womanhood and wifehood.

We cannot dispute the words of Dr. Collie, to the effect that: "The average working man's wife is lamentably ignorant of the value of the different food stuffs, and her unintelligent selection and bad cooking amount practically to under-feeding even though the bulk to all appearance be sufficient"; and we can fairly presume that such physical inefficiency as may be due to deficient nutrition is owing in a greater degree to "improper balance of food" than to actual "want of food," using the latter phrase in the generally accepted sense.

Alcoholism.—Closely connected with the subject of defective nutrition is that of the influence upon the offspring of alcoholism in parents.

There is no divergent opinion that the offspring of pronounced alcoholics often show an impaired general physique and mental weakness.

If we recognise the importance of the generally expressed opinion that the mother is the more

¹ Report of Inter-departmental Committee on Physical Deterioration, App. xxi.

potent parental factor for physical efficiency, these words from Dr. Ridge are of intensive interest:—

“In past centuries there have been many instances of drunken nations whose vitality does not seem to have been greatly interfered with. I attribute this to the fact that in those days the women, the mothers of the race, were sober. But if the mothers as well as the fathers are given to drink, the progeny will deteriorate in every way, and the future of the race is imperilled.”

It has been pointed out that where a father had commenced to take alcohol in excess after two or three of his children were born, any later births gave evidence of worse development than the earlier;¹ and that “pregnant women who are decided alcoholics miscarry to a much greater extent than others, and that when deprived of alcohol at an early stage of pregnancy (as when sent early to prison and subsequently delivered there), they may go through the full period of gestation.”

Dr. W. C. Sullivan found, in the enquiries which he made amongst the female chronic drunkards in Liverpool prison, that the mortality amongst their infants was at a rate two and a-half times as great as amongst the infants of sober mothers in the same station of life, and that in alcoholic families there was a decrease of vitality with successive children. This observer says: “As regards the vitality of the offspring, the

¹ Report of Inter-departmental Committee on Physical Deterioration, App. p. 68 (Shaw).

influence of maternal drunkenness is so predominant a force that the paternal factor is almost negligible."¹

Professor Demme² investigated twenty family histories, and tabulated his results as follows :—

	Ten Normal Families.	Ten Alcoholic Families.
Number of children . . .	61	57
Deformed	2	10
Idiots	0	6
Epileptic, choreic . . .	0	6
	(2 backward)	
Non-viable	3	25
Normal children	54	10 (2 ?)

We see from the above, that of the offspring of those parents in the alcoholic section only 17 per cent. were of full physical and mental vigour, compared with 88·5 per cent. of the children born of parents whose habits were "normal."

The following history is of a character not uncommon amongst chronic female alcoholics, and may serve as a type of many brought to light during this investigation.³

Mrs. L—, a chronic alcoholic of many

¹ *Journal of Mental Science*, 1899, and "Society for Study of Inebriety" Report, 1900.

² "Physiological Aspects of the Liquor Problem," edited by Billings, p. 373.

³ An enquiry into the history of 193 married and widowed women admitted into inebriate reformatories in 1905 showed that they had been the mothers of 1,110 children, of whom only 611 were then living.

years' standing, has had six children ; one only survives :—

1st child	. Premature	. Dead at birth.
2nd child	. Premature	. Lived a few hours.
3rd child	. Full term	. Lived a few hours.
4th child	. Full term	. Died at two months (cause "debility").
5th child	. Premature	. Lived one hour.
6th child	. Full term	. Living, suffers from "fits."

Dr. Robert Jones states that of the women admitted into Claybury Asylum during 1903 suffering from insanity of alcoholic origin, 80 per cent. were married and had families.

What sadder picture can words suggest than this : "The inner life and squalor of the poor is often shown up in the police-court reports, where the money given for housekeeping is used by the wife for drinking."

"All the deleterious effect of alcohol is liable to be reflected through the expectant mother upon the offspring in greater or less degree,"¹ this being so, it is a serious fact, but an acknowledged peculiarity, that if a woman tends to indulge in alcoholic beverages, it is during the pregnant period that she particularly craves for them.

The Greeks and Romans recognised that alcoholism in the mother endangered the unborn child, and therefore forbade the use of wine by newly married women.

The poor woman, when pregnant, lacking the means or inclination to prepare a nourishing

¹ *British Journal of Inebriety*, vol. ii., No. 4, p. 152.

article of diet, often flies to alcohol, mistaking, in her ignorance, the sensation of stimulation for that of nutrition.

Mr. Eccles thus expresses his views:—

“I believe that generations of alcoholic parents are just as likely to cause a modification in offspring, as the habitual breeding from a stock with any other physical or psychical cellular peculiarity engenders offspring with an intensity of this particular trait.”¹

The sad effect of alcoholism in parents upon their offspring is not limited to still-births, premature births, deaths in early infancy and physical defects, but is extended to varied forms of mental derangements in the living.

“Intemperance in pronounced degree on one side of the family usually results in mental feebleness of the children. When both parents are equally at fault the progeny usually show well-defined brand-marks.”²

Bournville found in his investigations of 1,000 cases of idiocy in the Bicêtre, that there was a history of alcoholism in the parents in 620 of them; and it is possible that this ante-natal factor may have been of moment in some of the remaining 380 cases, for such information is always difficult to obtain.

Dr. Ley states that of 172 backward and defective children, 73 had drunken fathers, 9 drunken mothers, and 12 alcoholic fathers and mothers.

British Journal of Inebriety, vol. ii., No. 4, p. 152.

“A Treatise on Mental Diseases,” Berkley, p. 492.

Apart from the ill effects upon the developing child, the indulgence of the parents in alcoholic beverages acts unfavourably upon the child after birth in the deprivation of proper food and clothing, and the consequently increased risk of inability to resist disease.

The evidence of Claybury, Nottingham, Glasgow and other asylums, suggests that cases of insanity following alcoholism in women have increased in number with the extension of female factory labour.

A lady—Miss Garnett—says of the Potteries :—

“I think drink among girls is due to the drink clubs. They are called ‘footings’ in some places. They are in almost every workshop. I think that is how these young girls learn to like the drink.” And her evidence is completed by : “During the last year I have seen young girls of sixteen or seventeen drunk in the streets in the dinner hour.”

Housing.—The housing of the poorer class of the community is a subject which has occupied the attention of sanitarians and philanthropists during recent years.

We find a persistent association of unsatisfactory housing conditions with high mortality, both of adults and children, but particularly among the latter section.

In a provincial town of upwards of 70,000 inhabitants, where the writer made several investigations, the infantile deaths averaged, during ten years, 151 per 1,000 born. An analysis

of the housing conditions in this town is as follows :—

ACTUAL NUMBER OF TENEMENTS OF EACH SIZE.

One Room.	Two Rooms.	Three Rooms.	Four Rooms.	Five Rooms and upwards.
153	538	350	1,587	12,101

ACTUAL NUMBER LIVING IN TENEMENTS UNDER FIVE ROOMS.

One Room.	Two Rooms.	Three Rooms.	Four Rooms.
210	1,219	1,214	6,334

PROPORTION WHICH THE NUMBER OF EACH SIZED TENEMENT BEARS TO THE TOTAL.

One Room.	Two Rooms.	Three Rooms.	Four Rooms.	17·85 per cent. of the total tenements are of four rooms or under.
Per cent. 1·04	Per cent. 3·66	Per cent. 2·38	Per cent. 10·77	

PROPORTION OF THE TOTAL POPULATION LIVING IN EACH SIZED TENEMENT.

One Room.	Two Rooms.	Three Rooms.	Four Rooms.	13·48 per cent. of the total population is living in four rooms and under.
Per cent. 0·32	Per cent. 1·83	Per cent. 1·82	Per cent. 9·51	

In Dundee it was found by Carnelly, Haldane and Anderson that in one-roomed tenements the rate of mortality among children under five years

of age was quadruple that found amongst those in four-roomed tenements.

Hampstead with 11·1 per cent. of its population living in one and two-roomed tenements has an expectation of life of 50·8 years at birth. Southwark with 31·6 per cent. of its population living under the same conditions of housing has an expectation of life of only 36·5 years at birth.

Sir Shirley Murphy found that during the ten years 1891—1900, those parts of the London boroughs which contained a lower proportion than 10 per cent. of the tenements with less than 5 rooms, and more than two inhabitants in a room, had an infantile mortality of 142 per 1000 born; with an increase of the proportion of such tenements to 10·15 per cent. of the total, the infantile mortality averaged 180; and when the proportion reached 30·35 per cent. the infantile mortality rate was 222.

Slum residence and high infantile mortality have been considered irremediable associates, and so long as we have the slum so will the excessive death rate of infants in such areas persist.

It is not difficult to explain why this association does exist. Speaking for the moment in a general sense we may say that it is the more inefficient members of society who sink to the lowest type of tenements, and having reached this haven, the very surroundings accentuate those failings—physical and moral—that may have been potent in causing their social descent.

Of the slums, with insanitary houses and unpaved courts, common water taps and disgracefully insufficient sanitary accommodation, what can we say? A remark in one of the classical reports of that great sanitarian Sir John Simon, which he wrote thirty years ago, applies to such conditions to-day as then, "they are gross and scandalous and very often, I repeat, truly bestial."

In an investigation by the writer of the housing conditions of the very poor in the provincial town to which reference has already been made, details were obtained as to the life in the "courts," "yards" and "places," of which there are about 100.

A few of the houses were neat and clean and a pleasing contradiction to the popular picture of such, but the majority were most unsatisfactory.

The following are notes of successive days' visits.

Court A. This consists of twelve tenements arranged in two rows of six houses, no one of which has through ventilation. One end of the court opens on the street full width: at the other end is a blank wall.

Ten of the tenements are two-roomed, rental 2/-.

One tenement is three-roomed, rental 3/- and one four-roomed, rental 3/6. The floor of the downstairs room in several of these houses is bricked unevenly; and many of the rooms,—living and bed-rooms—have the wall paper in a mouldy condition and stripping.

At one side of the upper end of the court is a short, narrow entry leading to a small unpaved yard in which is the *one and only water tap for all the houses*. Here also are the two wash-houses, the dustbin (emptied once a week) and the *two water closets*.

Court B. This is similar in shape to court A. The one water tap is in the middle of the unpaved court. *Two water closets in a dark passage suffice the needs of twelve tenements.*

Ten of the tenements are three-roomed, and one house on either side of the top of the court has had the lower room transformed into a wash-house for the public use of the court. In these two last named, an outside staircase gives entry to the upper two-roomed tenements. In one of these the lower room measured 10 ft. 6 ins. by 11 ft. 3 ins. and 6 ft. 9 ins. in height, and in it, man wife and two children lived and slept;—a dog also occupied it by day,—the upper room was not used because the roof was dilapidated and the window frame was out. The rents were $1/8$, $2/3$, $2/8$ and $3/6$.

Court C. Entered from the street by a narrow unpaved yard, the ground being deeply furrowed by storm water.

There are eight houses: seven, two-roomed; one, three-roomed. No through ventilation. One water tap, five wash-houses, and three water closets; the latter in a very clean condition.

Court D. Entered from the street by a narrow yard.

Ten houses; three are three-roomed, the remainder two-roomed. Three houses have a water tap to each; seven use a common tap. Three wash-houses; three water closets. No through ventilation. Rent $2/2$, $2/6$, $2/9$ and $3/-$.

Court E. A very bad type of court. On entering it we reach eight of the houses on the left side facing a blank wall.

At the top and bottom of this row is an entry leading to the other side of the court where eight houses are backed on the aforementioned row: there is therefore no through ventilation for any of these sixteen houses. At the end of a piece of waste ground are the *three water closets*, (two of them in a disgraceful condition of filth, the flushing apparatus out of order) two wash-houses, and two water taps, which are to serve the needs of all the occupants of the court.

Twelve of the houses are two-roomed, rental $2/3$, and four three-roomed, rental $2/6$.

These particular courts were not selected because of their unsatisfactory conditions, but are given in the order they were visited by the writer in a particular locality.

It may astonish many readers to be told that houses of this character are very often a most remunerative investment—for the landlord; but, the perpetuation of such dwellings is most unremunerative for local authorities and the nation.

An owner of one court boasts a return of 19 per cent. on the purchase money; and a rent collector for another court—not one of the above—admitted that if only one third of his tenants paid their rents the property was worth holding.

Sir Charles Cameron recently conducted an enquiry as to the rents paid in a certain street of poor houses in Dublin. The total of the rents was £2365 6s. and at fair valuation, making a satisfactory return on the purchase money, the total rental should not have exceeded £857 10s.

The improvement of the slum area is one of our most urgent necessities,—for ill housing acts and re-acts unfavourably, the physical and moral health of its denizens are imperilled, and the children are soon affected by its contaminating and depressing influences. It is to the interest of the whole community that the “nation’s hopes” in particular should be protected, for it is in the slum districts that we find the infant death rate so excessive, and the incidence of diseases among the children so abnormal.

Dr. Collie crystallises the dangers to the community which slum life engenders in the following words:—

“Those that are underfed and ill housed (more especially if they happen to be parturient women or very young infants) must, and always will be physical degenerates; overcrowding, insanitary environment, early marriage, large families, ignorance of the elementary principles of infant feeding, combine to keep up a steady supply of those who are physically

unfit, mentally below the normal and generally morally debased."

Notwithstanding the detrimental attributes of the slum dweller, he can become a citizen of a better type, if we help him and insist upon an alteration in his surroundings. To those who know and appreciate the work of Miss Octavia Hill and others in the regeneration of the slum, it seems astonishing that every town has not its volunteers working along the same wise lines of action. It is nearly forty years since Miss Hill wrote in *Macmillan's Magazine* :—

"I feel most deeply that the disciplining of our immense poor population must be effected by individual influence and that this power can change it from a mob of paupers and semi-paupers into a body of self dependent workers."¹

The fruits of this worker's efforts prove the correctness of her assertion.

But, to simply move the slum inhabitant into a better class of dwelling without taking that individual interest in him which has been a characteristic of Miss Hill's method is to court disaster.

The slum dwelling is not the perquisite of the town, it is to be found in the country as well. The sad truths brought to light in the enquiry of 1842 concerning the country cottagers' accommodation represent the conditions in many parts even to-day.

¹ "Four Years' Management of a London Court," July, 1869.

One witness then said :—

“The labourers’ most common vices are, it is true, pretty well known, for they have been exposed with no hesitating pens, have been officially proclaimed throughout the length and breadth of the land; but the hardships of his life at best, its temptations; the manner in which he often sees the welfare of the beast he drives more valued than his own; forced to pay an exorbitant rent for a dwelling in which he cannot decently rear his family: these are parts of his condition on which the public are not so well informed, or at least of which they seem to act in perfect ignorance.”

The difficulty of obtaining houses in the country, the insanitary condition of a large proportion of the cottages in certain districts in particular, combine to render acute the rural housing problem.

Sixty years have passed since the holding of the enquiry which brought to light such unsatisfactory conditions in the life of the rural poor. Now, in one district where rural depopulation is occasioning anxiety we see that it is due to “old cottages falling down and difficult to get new ones provided;” in another because “nothing is being done to better the housing of the working classes;” in yet another, “a large number of cottages have been closed because the landlords will not effect the necessary improvements, no new ones built.” Such are the conditions of to-day. Not the least prominent cause of the migration of the country inhabitant to the town is the unsatisfactory housing provision for the former. It is generally

the more vigorous who have left for the town, leaving the weaker to perpetuate the rural race; the physical efficiency of the farm labourer of to-day is not what it was twenty-five years ago.

To this migration, and the development of what was a rural into an urban district, are due this change, namely, in 1851 half our population was rural, in 1901 only 23 per cent.

CHAPTER V.

THE MILK SUPPLY.

RECOGNISING the fact that a large proportion of infants are and must be fed otherwise than by the breast we are now concerned with the supply of cow's milk to the community.

The experiences of combined efforts in various places in France, Germany and other countries on the European continent, in America, and more lately in Great Britain, show that reduction in the mortality of artificially-fed infants can be obtained by the exercise of a strict supervision over the milk supply and by instruction in the methods of feeding.

Dr. George W. Goler, of Rochester, N.Y., writes:—

“Milk, the chief, the most necessary and most perfect food for children, is the dirtiest of all foods. After it becomes dirty, as it usually does from barn-yard filth, street dust, etc., no process of filtration, pasteurisation, or sterilising can possibly make it a fit food for infants. These various processes may lessen the danger, but they cannot wholly remove it. The infant fed upon dirty milk subjected to a heating process, is no longer fed upon milk, but upon the chemical constituents of a fluid containing products derived from bacterial life, transformed by heat and unfit for its digestive apparatus.”¹

¹ “American Medicine,” vol. vi., No. 25, pp. 989, 991.

This strong indictment is not in the least too strong; the condition of the milk supply in many civilised countries has been largely responsible for a greater slaughter of lives than the most sanguinary of wars.

A report of an investigation in 1904 by a Medical Inspector of the Local Government Board, of the sanitary conditions of a certain rural district which is in the heart of the dairying industry in Wiltshire is of great value. The milk from this district was sent to four or five of the largest metropolitan dairy companies. The inspector laid stress on the facts, that of the one hundred and six different milk supply premises, only two were registered in accordance with the requirements of the Dairies, Cowsheds and Milkshops Order; that of twenty-nine members constituting the rural district council, five were milk sellers, and four of these occupied unregistered premises; and he said he could not call to mind one satisfactory farmyard, many were dirty and untidy, some filthy in the extreme.¹

And we learn further from analyses made by the Medical Officer of Health for the county that of one hundred wells used by the dairymen in this district, six were "fairly good," ten were "indifferent," eighteen were "bad waters," all giving indications of pollution with organic matter of animal origin," and sixty-six were "very bad waters and quite unsafe for use for domestic purposes, and

¹ Dr. Fletcher's Report, 1904.

the majority might be classed as highly dangerous."

Apart from the disgraceful insanitary conditions, two items in the above report demand notice, namely, less than 2 per cent. of the dairymen's premises were registered, and the district council contained on its board five milk purveyors, of whom four had not complied with the law in regard to registration.

A special report by the Medical Officer of Health for Bristol in 1904 describes the unsatisfactory condition of the dairy surroundings in that district. He speaks in it of the overcrowded cowsheds, the lack of light and of the inefficient ventilation; the pools of manure; cleanliness is a thing almost undreamt of, the walls being plastered with filth; and it was a common matter to find "the quarters of the animals caked with dried dung and dirt." Of fourteen well waters at these farms, analyses showed seven polluted with sewage.

A more general statement may be quoted:—

"In the vicinity of our large towns it is no uncommon thing to see cows out at pasture in fields watered by brooks contaminated by sewage water; and their udders, and consequently the milkers' hands become befouled with sewage. In the winter time the cows are frequently fed largely on turnips and brewers' grains, instead of hay, maize, or any other dry fodder; possibly also, their sheds are infrequently cleaned out and only sparingly supplied with straw so that the animals lie in fæces, and their udders may be seen caked with dried excrement."¹

¹ Ashby and Wright, "Diseases of Children," p. 46.

A brief review of the existing legislation in regard to milk supply in England and Wales may be of interest at this point. Under sect. 34 of the Contagious Diseases of Animals Act of 1878 power was given to the Privy Council, and by a later amendment to the Local Government Board, to make Orders in regard to dairies, etc., and thus we had the Dairies, Cowsheds, and Milkshops Order of 1885, amended in 1887 and 1889.

Under this Order, it is expressly stated in sect. 6 that it shall not be lawful for any person to carry on in the district of any local authority the trade of cowkeeper, dairyman or purveyor of milk unless he is registered as such, and every local authority is requested to keep and revise a register. It is illegal under this Order for a dairy or cowshed to be established in any building where the lighting, ventilation, air space, cleansing, drainage and water supply are not such as are necessary for the *health of the cattle, the cleanliness of milk vessels, and the protection of milk against infection or contamination*. It also requires that the milk of an animal suffering from cattle plague, pleuro-pneumonia, foot and mouth disease, or disease of the udder certified by a veterinary surgeon to be tubercular, shall not be sold or used for human food, nor for the food of animals. In the latter case it may be so used when boiled. Local authorities are empowered under this Order to make certain regulations, and in the model set

issued by the Local Government Board are included these excellent sections:—

“Dairymen shall not allow any cow belonging to them, or under their care, to be milked for the purpose of obtaining milk for sale *unless at the time of milking the udder and the teats are thoroughly clean, and the hands of the person milking clean and free from all infection and contamination.*”

“Every cowkeeper shall on every occasion when a milk vessel has been used to contain milk, or shall have been returned to him after having been out of his possession, cause such vessel to be forthwith cleaned with steam or clean boiling water.”

“A purveyor of milk shall not deposit any milk intended for sale in any room or place where it would be liable to become infected or contaminated, . . . or in any room used as a kitchen or living room.”

During the summer of 1906 the writer was brought in contact with a dairyman who distributed most of his milk by cart. The dairyman's child was suffering from diarrhœa, the soiled clothing was lying in a heap in the corner of the scullery where three large pails of new milk were stored. There was no covering over the pails, and the room was alive with flies.

Sect. 6 of the Order also states: “It shall not be lawful for any cowkeeper, dairyman or purveyor of milk to allow any person suffering from a *dangerous infectious disorder*, or having recently

been in contact with a person so suffering, to milk, cows, etc. . . . until all danger of the communication of infection to the milk or of its contamination shall have ceased."

The expression "*dangerous infectious disorder*" is too loose a definition; it should rather be "*any infectious disorder*."

Under seal of June 6th, 1905, the Board of Health of the City of Boston, U.S.A., amended the "Regulations for the Sale and Care of Milk of 1898 and 1904," and this may be quoted as a type of the latest legislative effort in America and a fitting one to compare with our "Dairies, Cowsheds, and Milkshops Order."

It provides that:—

All persons who are engaged in the production, transportation and selling of milk shall on the 1st day of May or within 30 days, make written application to the Inspector of Milk, and no person shall engage in such business without a licence.

The conditions under which every cow is kept shall if necessary be made known to the Board of Health and *no milk except that derived from such cow* shall be brought to, or delivered in the City.

No milk shall be sold which has been drawn from cows within 15 days before or 5 days after parturition, *nor unless the cows from which the milk was derived have within one year, been examined by a competent authority and shown to be free from diseases dangerous to the public health.*

Milk kept for sale in any shop or restaurant shall

be stored in a *covered cooler*, and this shall be kept only in such locations as may be approved by the Board of Health.

All wagons used in the conveyance of milk shall be kept in a cleanly condition and free from offensive odours.

Every person engaged in the production, transportation, or sale of milk, immediately on the occurrence of *any case of infectious disease either in himself, or in his family, or amongst his employés or their immediate associates* shall notify the Board of Health and shall suspend the sale and distribution of milk until authorised to resume the same by the Board.

No person shall deliver, or have in his custody with intent to sell or exchange, any milk, skimmed milk or cream which contains more than 500,000 bacteria per cubic centimetre, or which has a temperature higher than 50° F.

It will be seen that in several respects the above regulations are superior to the requirements of our Dairies, Cowsheds and Milkshops Order, though, were the provisions of the latter enforced to the full, and if local authorities adopted the regulations empowered them by the Order, more satisfactory conditions would obtain.

There is not, however, with us any demand that the cows supplying milk for human consumption shall have been examined as to their state of health by a competent official.

How necessary this is, in one particular only, is

illustrated by the number of milks which contain the tubercle bacilli. Not all the milk supplied to the community can be tested bacteriologically and it is certainly a matter for alarm that chance samples should yield the results they do. It is true, the Order specifies tubercular disease of the udder as a condition which, if present, shall preclude the sale of the milk for human food, but the comparative futility of this provision is recognised when we are told that with the exception only of the kidneys, the udder is the organ in the cow which is least often affected with tuberculosis.

The advisability of excluding from a dairy herd any cow suffering from tuberculosis—not limited to the udder—is suggested by the fact that milk may contain the tubercle bacillus when the disease exists in parts of the body other than the udder.¹

The tuberculin test has demonstrated the fact that where cows have been crowded together in unhealthy cowhouses, as large a proportion as 50 to 70 per cent. were affected with tuberculosis whereas the udders were affected in only $\frac{1}{2}$ to 2 per cent. of them.²

Professor Bang of Copenhagen, based on his observations in Denmark, states that in stables of over 50 head of cattle, an average of 60 per cent. are tuberculous.

Investigations made by the tuberculin test in England and Scotland have shown that of the

¹ *American Journal of Medical Sciences* (Ernst), November, 1889; *Zeitschrift für Hygiene und Infektionskrankheiten* (Rabinowitsch and Kempner), xxxi.

² "Encyclopædia Medica," vol. xii. p. 437.

dairy herds submitted to the test 25 to 40 per cent. of the cattle were tuberculous.

Of samples of milk taken in Copenhagen, Professor Bang found 15·5 per cent. contained the tubercle bacillus, and Dr. Martin found 33 per cent. of the samples of milk in Paris so infected. In Liverpool, in 1903, of 582 samples 21 were contaminated with the tubercle bacillus; in 1904, of 571 examinations the bacillus was found in 41 instances.

In Sheffield, in 1903, 76 samples of the milk coming into the city by road or rail were examined and 11 contained the tubercle bacillus.

Several local authorities in England have obtained Acts to enable them to deal—more fully than is allowed by the D. C. and M. Order—with the prevention of tuberculous infection through the milk supply. Thus, among others, we find the Manchester General Powers Act, 1904, under which power is given to seize and destroy cows suffering from tuberculosis of the udder. Liverpool has a Local Act, 1900, which enables the Health authorities to prohibit the importation into the city of milk, if in the opinion of the Medical Officer of Health such is contaminated in a manner likely to cause tuberculosis. The Wigan Corporation Act, 1902, determines a penalty for selling milk from cows with tuberculous udders, or for allowing such cows to be with others in the dairy herd, and requires the dairyman to give immediate notice to the Medical Officer of Health if he suspects tuberculosis of the udder in any of his

cows. Birmingham, in 1903, obtained powers to deal with cows suffering from tuberculosis of the udder, the milk from which was being sent into the city; and powers of the same nature were obtained by the Bristol Corporation Act of 1905.

Professor von Behring, in no uncertain words, states that tuberculous milk given to infants is the chief cause of tuberculosis.¹

During the last forty years there has been a great decline in pulmonary phthisis, but abdominal tuberculosis in children shows if anything an increase, and coincident with this we have a greater prevalence of tuberculosis among cattle, and a larger proportion of infants that are not breast-fed.

To those who claim that tuberculosis of glands, serous membranes and joints, met with in children, are of bovine origin, and conveyed by infected milk, a large measure of support is given by this experience; in countries where tuberculosis of cattle is rare, tuberculosis in children is also uncommon.

In India pulmonary phthisis is very prevalent, but tuberculosis among children is very rare. Dr. Crombie tells us that he never saw hip disease in a child there, and with this significant fact is associated the statement that tuberculosis of cattle is exceptional.

¹ Few observers are prepared to go quite as far as Professor von Behring, but it is well recognised that too little attention is given to the possible and probable ill effects associated with the use of tuberculous milk.

In Egypt, where all the children are fed on the breast up to two and even three years, abdominal tuberculosis and glandular affections of a tuberculous nature are rarely seen.¹

The Government Medical Officer of Siam writes :—

“During eight years’ practice in Bangkok I do not remember having ever seen or heard of any case of strumous joints, lupus, or tabes mesenterica, or, in fact, of tuberculous affections of such nature in children. The Siamese practically never drink cows’ milk, either children or adults.”²

Tuberculous infections of the glands in the neck are common conditions among children. In all probability this infection is derived from contaminated food, and this is usually milk. It is of interest to know that we find a corresponding condition in the pig when it has been fed on milk from a tuberculous cow, the bacilli gaining entry by the pharynx and tonsils.

Professor Adami, in the Canadian Blue Book A, 1902, Sessional Paper No. 15, says that he cannot explain the contrast in the mortality statistics of phthisis and tabes mesenterica, save on the supposition that impure and infected milk is an essential factor in the production of abdominal tuberculosis in young children; but that not all these cases, it is true, should be regarded as due to milk.

¹ “Human and Bovine Tuberculosis” (Raw), *Brit. Med. Journ.*, 1904, vol. ii. p. 909.

² “Human and Bovine Tuberculosis” (Raw), *Brit. Med. Journ.*, 1906, vol. ii. p. 358.

The undoubted fact that many adult persons drink milk from tuberculous cows with apparent impunity has led some observers to deny the possibility of infection. But is such a deduction warranted? The evidence of Dr. Naegeli, of Zurich, suggests that it is not, for he was unable, in a large series of autopsies, to discover a single instance of a body—over thirty years of age—in which there were not signs of either a present or past tuberculous infection in some organ. Of those between eighteen and thirty years of age, 96 per cent. were affected in some degree, and of those between fourteen and eighteen years of age 50 per cent. Dr. Franz, an Austrian army surgeon, using injections of tuberculin as a diagnostic agent, found, in 1901, that in two regiments of infantry 61 per cent. of those in the first year of service, and 68 per cent. of the second year service men, suffered from tuberculosis.¹ These regiments were composed of men supposed to represent the healthiest of the population; obviously, then, there were no physical signs of the disease so far as an ordinary examination would elicit. Professor von Behring says:—

“It is not yet proved that healthy full-grown persons become ill with tuberculosis as a result of eating food derived from tuberculous cattle (milk, butter, meat), unless the epithelial covering of the intestinal mucous membrane is defective or ulcers exist after exanthemata, typhoid and dysentery.”²

Cassel Lecture, 1903, Professor E. von Behring.

² *Beiträge zur Experimentellen Therapie*, 1904, No 8.

In healthy adults, albumins cannot penetrate the intestinal mucous membrane unchanged, and this characteristic, together with the anti-bacterial action of digestive juices, have a like deterrent effect upon the passage of pathogenic and virulent bacteria, but in the *young of all species* albumins and bacteria can penetrate the intestinal mucous membrane unchanged, because "the mucous membrane of the new-born possesses no continuous epithelial covering, and the gland tubes of the ferment-producing glands are little, if at all, developed at this time."

In proof of this Professor Behring has quoted the following: "After a *single* feeding of a small quantity of tubercle bacilli, only the new-born or a few days' old guinea pigs became tuberculous,—of those that survived, even while their general health remained good, it was always possible to demonstrate a tuberculosis of the glands of the neck, and not infrequently, later on, a type of tuberculosis which is often regarded as the expression of an inhalation tuberculosis."

This last statement is of interest and importance, to the effect that, in animals, infection of the lung may follow the ingestion of food contaminated by the tubercle bacilli—similar conditions may obtain in children. Professor Sims Woodhead had previously written:—

"I have seen in case after case in children and in animals fed on tuberculous material, the lungs markedly affected; but in a large proportion of

these cases it has been possible to trace the course of invasion back from a caseous or old calcareous mesenteric gland, through the chain of retro-peritoneal glands, up through the diaphragm to the posterior mediastinal and bronchial glands, and so on to the lungs."¹

Ravenel, Fibiger, Nocard and other investigators working at this subject in different countries, maintain that the bacillus of bovine tuberculosis is more dangerous to man than the human variety, particularly during childhood, and Weber—one of the three German Commissioners appointed by the German Imperial Health Office—considers that precautions for the regulation of the milk trade are necessary because of the undoubted danger arising from contamination of the milk by the tubercle bacilli, although one may not be able at present to accurately estimate the extent of this danger.

Enough has been said to convince the reader that milk from tuberculous cows is a danger to children; and there is no doubt that the strict inspection of cowsheds and dairies with unwavering loyalty to the regulations of the Dairies, Cowsheds and Milkshops Order, together with the isolation of tuberculous cows, would soon cause a great diminution in the distressing frequency of tuberculous affections in children.

To quote Dr. Nathan Raw:—

"In Liverpool I have noticed a great diminution in abdominal tuberculosis and enlarged glands in the

¹ *Lancet*, 1894, vol. ii. p. 960.

neck during the last two years, due in a great measure to the rigorous inspection of all dairies, and the supply by the city of sterilised milk for the poor. In fact, I believe that when tubercle is stamped out from cattle, surgical tuberculosis in children will to a great extent disappear with it."

To combat this great danger from milk contaminated by the tubercle bacilli, we need the official recognition of the tuberculin test for the cattle, and the exclusion of the milk of such animals as react to it.

Professor Calmette and M. Breton conducted experiments recently which proved that the milk produced by tuberculous cows, even when sterilised, is dangerous for healthy children, and particularly dangerous for those already infected, for the ingestion of the dead bacilli is potent in hastening the death of the latter individuals, and serious trouble follows in the case of the healthy. M. Calmette, as a result of his experience, demands that all dairymen and cowkeepers shall be compelled to periodically submit all their cows to the tuberculin test.¹

The Bonn rules are suggestive as to the lines that might be adopted for the purpose of ensuring a more satisfactory condition of the milk supply:—

(1) The milk of cows reacting positively to the tuberculin test must not be used for infant feeding, nor for the food of calves.

(2) In constructing new stables it is urged that several small stables should be used in preference

¹ *Quinzaine Thérapeutique*, March 10th, 1906.

to one large stable; and the animals should be placed with their heads towards the lateral walls, and not head to head facing a common feeding trough along the middle of the stable.

(3) The feeding troughs should be kept well cleaned, and the drinking water supplied to cattle should meet essentially the same requirements as are demanded of water supplied to dwellings.

(4) Efficient pasturage is essential.

(5) The prevention of accumulation of infectious material on the stable utensils, in the food, on the body surfaces of the cattle, on the clothing of the stablemen, ensuring also cleanliness of milkers' hands, and the removal of dirt from under the nails.

(6) The ensuring of cleanliness of the udders and tails of the cows.

(7) The milk vessels to be of tinned sheet-iron.

(8) The milk to be strained through aluminium, nickel or brass gauze, which is then to be cleaned.

(9) The cooling of the milk, immediately after it has been drawn, to 4—7° C. It is important to note here that temperatures of less than 2° C. have an injurious influence on anti-bacterial substances in milk.

It is obvious that all the measures here suggested are such as are requisite to ensure a pure supply of milk; but it is necessary that even further precautions should be taken.

Excellent though it is to produce a pure milk, unless there is as much care from the milking of

the cow to the feeding of the child, we are risking disease and death for those for whom milk is the sole food. And equally, whatever care may be taken by the milk vendor and the buyer, all is of little avail if the milking and the transportation of the milk are not conducted with hygienic precautions.

The Milk Commission of the Medical Society of the County of New York found that the milk from four *dirty* cows in a clean barn, with a clean milker, gave an average of 90,000 bacteria in a cubic centimetre; whereas that from four *clean* cows in the same barn, with the same milker, gave an average of only 2,000 bacteria in a cubic centimetre. A point of great importance is to keep the milk at a temperature which is not favourable for bacterial growth. Dr. Chapin, in his work on infant feeding, quotes the following to show the rate of growth of a single bacterium in milk under different temperatures and at various intervals.

	In Two Hours.	Three Hours.	Four Hours.	Five Hours.	Six Hours.
At 54° F.	4	6	8	26	435
At 97° F.	23	60	215	1,830	3,800

It is impossible to magnify the necessity of realising the import of such evidence, and knowing that the milk in use contains thousands of

bacteria in each cubic centimetre, the gravity is intensified.

In July, 1903, samples of milk were taken in Glasgow at the railway station, before it came into the hands of the milk vendors in the city.

The number of bacteria in unpreserved milks varied from 4,000 to 3,904,000 in each cubic centimetre; and the prodigious rate of increase of germs in such polluted milk is evidenced by the fact that a sample of the milk containing, originally, the least number of bacteria was taken in a dwelling-house six hours later, and showed, on examination, 880,000 bacteria in each cubic centimetre.

In Liverpool, in 1903, there were taken 252 samples of the milk coming to the city by train; of these 138 contained the *B. coli communis* (meaning contamination with dirt, or inflammation of the udder), and 50 the *B. enteritidis sporogenes* (meaning dirt, or fæcal contamination). In 1904, 370 samples from the same source were taken; contamination by the *B. coli communis* was found in 119, and by the *B. enteritidis sporogenes* in 35 of them. As a proof of the good effect of supervision of the cowsheds, etc., in the city, it was found in 1903 that of 231 samples of milk from town cowsheds, 35 showed the presence of *B. coli communis*, and 4 the *B. enteritidis sporogenes*; and in 1904, of 201 town milks, 22 contained the *B. coli communis*, and 8 contained the *B. enteritidis sporogenes*.

A certain number of bacteria are always present, even in milk drawn under the best conditions,

but an excess of these—usually harmless—and the presence of noxious bacteria, suggests in the former case that the milk has not been kept cool, and in the latter contamination.

In New York a committee of medical men met certain of the milk dealers and suggested a standard of purity for the milk which they supplied. This resulted in the limit of bacterial presence to 30,000 in each cubic centimetre and the acidity not to exceed 0·2 per cent. For some time it was found difficult to produce the milk within these limits of slight impurity, but by advice and careful surveillance it was found, at length, that milk well within the standard could be supplied to the public.

The City of Rochester, U.S.A., affords another example of the value of supervision of the milk supply. Dr. Goler, the health officer, writes:—

“In order that at least a majority of milkmen should supply milk having a standard of cleanliness, the inspection of stables from which a city gets its milk supply must be rigidly carried out; the cattle and the milk utensils must be examined closely, and cleanly requirements enforced; the dairy, milk cans, wagons, etc., must be subjected to the same precautions, and finally, the city milk laboratory must insist upon a bacterial standard of cleanliness in order that the milkman hold his licence.”

And upon such lines was the reform attempted. A circular was sent to all the milkmen supplying milk in the city informing them that 100,000 bacteria in each cubic centimetre would be the standard of cleanliness required.

Dr. Goler furnished the writer with his experience of four years subsequent to the issue of the notice.

Prior to this action, the average of several samples of milk showed bacteria to be present to the extent of 837,000 per cubic centimetre, and this after excluding 26 per cent. of the samples taken which contained over 5,000,000 bacteria per cubic centimetre.

Within four years 33 per cent. of the samples contained less than 100,000 bacteria per cubic centimetre.

There have been several "milk commissions," and many attempts to fix a universal standard of cleanliness and purity. The standards suggested have varied from 10,000 to 100,000 bacteria per cubic centimetre.

One dairy farm in the United States was able, by strict attention to cleanliness and ordinary hygienic precautions, to show during a whole year's observation an average bacterial content of only slightly more than 5,000 per cubic centimetre, twelve hours after milking.

Of course, the milk that is supplied from cans, door to door, shows on examination a greater number of bacteria than would be found in milk from the same source, if bottled. We are told in regard to the former method of distribution, that in hot weather 40,000,000 bacteria in each cubic centimetre is not an unknown result of bacteriological examination.

It is not difficult, however, with bottled milk, and in the hottest weather, to secure an average of less than 30,000 bacteria per cubic centimetre.

The existence of several outbreaks of infectious and contagious diseases in which the milk supply was the offending agent, show again the necessity of formulating strict rules and the advisability of exercising diligent supervision over the sources of milk.

Kober summarised 330 such outbreaks; of these 195 were typhoid fever; 99 scarlet fever; and 36 diphtheria.¹

Several outbreaks of illnesses, with sore throat as the prominent symptom, have been traced in origin to the milk supply.

Of recent outbreaks of this character were those in Bedford, 1902; Woking, 1903; Finchley, 1904; and in Colchester, 1905.²

From a healthy cow the milk as it leaves the udder is a sterile fluid, but it does not retain this estimable character for long. Dirty udders; soiled hands of the milker; careless milking; cans, perhaps, imperfectly washed, and with water from all sources; insanitary sheds, not uncommonly laden with the dust of ages, in which the milking proceeds; the vessels in which the milk is exposed for sale very commonly uncovered and the surface of the milk itself plentifully dotted with

¹ *American Journal of the Medical Sciences*, May, 1901.

² There were in Colchester at least 600 cases of illness due to disease in one cow.

drowning flies; all these add their quota of contamination.

Dangerous as is the unclean dairy, the chandler and greengrocer, with their small trade of a gallon of milk—or less—a day, sold in halfpenny, and even farthing's, worth, are even more potent in furnishing the infant with unclean milk.

The milk in the open pail absorbs with avidity the odours abounding in these ill-ventilated shop-lets, and affords an ideal culture-field for the innumerable unfriendly bacteria which find under these conditions all to favour their powers of prodigious multiplication.

Dr. Newman, in an investigation of the milk shops in Finsbury in 1903, found 52 per cent. with one or more sanitary defects; and 73 per cent. where the vendors failed to keep their milk covered or protected from dust; and, further, it was shown that 48 per cent. of the shops were of small general dealers, doing a daily milk trade of only a few quarts or pints.

In the homes of the consumers, particularly in those houses where digestive disorders cause so many infantile deaths, the storage of food receives scanty consideration.

The writer examined fifty-two houses in the poorest quarters of Ipswich, where deaths from infantile diarrhœa had occurred, as to the situation of the pantry or cupboard where the milk was kept and as to the ventilation of such stores.

SITUATION OF THE PANTRY OR CUPBOARD WHERE THE MILK WAS STORED.

Scullery.	Cupboard by Fireplace.	In Cellar, or at Head of Cellar Steps.	In Cupboard in Living Room, but not by the Fireplace.	In Cupboard in Front Room.
2	20	9 ¹	14	7

VENTILATION OF THE ABOVE STORES.

Without Ventilation.	Ventilated from Street or Yard.	Ventilated from a Passage in the House.	Ventilated from the Cellar only.
4 ¹	5 ¹	1	5 ¹

Of late years a dangerous element has been introduced into the milk publicly supplied—the use of preservatives.

This practice is justly stigmatised as being “unnecessary, undesirable, and as a rule physiologically indefensible” (McFadyean).

A Commission appointed to investigate the significance of the use of preservatives and colouring matters in food drew up several valuable recommendations at the conclusion of the sitting. Not the least important was:—

“That the use of any preservative or colouring matter whatever in milk offered for sale in the United Kingdom be constituted an offence under the Sale of Food and Drugs Act.”

¹ Four of the pantries at the head of the cellar steps were ventilated from the yard at the back of the house; the remaining five from the cellar only.

A brief attention to a few points in the evidence advanced before the Commission will well repay us:—

“There is no guarantee against the addition of excessive amounts of preservatives to milk.”

“A great objection to their use in milk is that they may be relied upon to protect those engaged in the trade from the immediate result of neglect of scrupulous cleanliness. It may remain sweet to taste and smell, and yet have disease germs of various kinds, of which the activity may be suspended for a time by the action of the preservatives, but may be resumed before the milk is digested.”

“As many of the preservatives are added for the purpose of destroying or preventing the development therein of living organisms, these same substances when introduced into the highly organised animal could not behave indifferently to living matter, but must tend to exert upon it the same influence.”

“By the use of preservatives in milk, dirt, putrefaction and infective quality are concealed, which is likely to lead to neglect of cleanliness and is a cloak for dirt.”

“The decomposition of milk is often disguised by the use of boracic acid and other preservatives.”

“In Denmark the use of preservatives in the milk supply of towns is prohibited.”

“In America, Germany, Austria and Belgium prohibition of preservatives in milk is the rule.”

Much more in the same strain might be quoted, but we think that it is not necessary; and from the evidence advanced before this Commission two deductions may be drawn:—

(1) The addition of preservatives to milk is to be deprecated because of the injurious effect of

the chemicals used on the health of infants and children.

(2) The use of preservatives in the milk supplied to the public should be checked, inasmuch as they serve as a cloak for the effects of the neglect of cleanliness; and since the farmer, middleman and dairyman may each use it in the same milk, it is a danger the seriousness of which cannot be magnified.

In Denmark it is found possible to supply the population with pure milk without the use of preservatives. From the cowshed to the consumer abundant care is exercised.

The cowsheds are well lighted and ventilated, with floors and walls of impermeable material. After milking, the milk is screened immediately, to remove the hair and other foreign substances likely to be coated with bacteria, and in some instances the milk is also filtered through gravel, after which it is efficiently cooled; thus inhibiting bacterial growth.

In Copenhagen, the milk, from its collection to its distribution at the doors of the customers, is kept by block ice at a temperature below that at which putrefaction or decomposition would set in.

It has been found in England that milk cooled to 55°—60° will keep sweet for 36—48 hours in cool weather, and in the hottest weather or 24—36 hours.

Reference must be made to certain regulations which are enforced in Dusseldorf. The milk

offered for sale there is known as "full milk," "skim milk," and "children's milk," and which it is must be designated by a plate or card so arranged that the inscription may be read with ease.

Of the first and second grade we need not speak, but the consent of the municipal authority has to be obtained before milk can be sold under the title of "children's milk." Before consent is given by the municipal authority, proof must be advanced that the cows from which this milk is taken have been tested with tuberculin and do not react to the test; that they are otherwise sound and that the cowsheds in which they are stabled fulfil all sanitary requirements.

The animals from which this special milk is taken are not allowed to share cowsheds with other cattle, and must be fed appropriately.

The milkers are required to wear clean overalls; their arms and hands are to be well washed, *and the finger nails kept clean.* The milk is filtered or sterilised and then cooled; *the use of any preservative is strictly forbidden.*

Other articles of the regulations refer to the vessels in which such milk is stored, the material of which they are constructed, and provision for keeping them covered.

The greatest interest for us centres in the fact that in the Dusseldorf milk regulations there are articles which require the recognition of special precautions in that portion of the milk supply which is intended for infants and children.

In conclusion, though recognising that dairy legislation has done much to improve the condition of the milk supply in England and Wales, more could have been done if the Order had been faithfully interpreted by all local authorities. To apply the power of present legislation to the full depends upon the activity of local authorities, and while appreciating the faithful and discerning action of some of these bodies, there are, unfortunately, others who have not, and do not, realise the responsibility that rests upon them.

Article 15, in the Order now in force, specifies certain diseases of cows which shall debar the sale of their milk for human consumption, but there are many other diseased conditions—particularly of the udder—which injuriously affect the milk secreted by the animals suffering from them, and render it dangerous for use, particularly in the case of children.

At the recent National Conference on Infantile Mortality the following resolution was moved by the Medical Officer of Health for Glasgow :—

“That the Dairies, Cowsheds and Milk Shops Order is defective, and that any amendment should extend the definition of diseases applied to animals, and should make the provision of regulations by local authorities compulsory. That the scope of the regulations should be extended to cover dirty milk, and should enable local authorities to prohibit the sale of any milk which fails to comply with the conditions of purity agreed upon.”

This resolution was carried without a dissentient.

CHAPTER VI.

EXISTING AND REQUIRED AGENCIES AND ORGANISATIONS OF IMPORTANCE TO INFANT LIFE.

REFERENCE is made in another chapter to the value—as evidenced by the greater average weight of the child at birth—of care for the mother during the period of pregnancy, and Dr. Pinard's statistics from the *Dortoir de la Clinique Baudelocque* are, in this connection, of great interest. These statistics refer to the weight of the child at birth and the duration of pregnancy ; but the good effects are to be seen in yet another direction, for Dr. Pinard says, “ the children are born in the best conditions of health and vigour.”

To counteract and to prevent those adverse conditions which act upon the infant prior to its birth demands action. Too little thought is given to the provision of such agencies as are demanded, and we cannot deny that efficient provision for this purpose means the undertaking of a task of great magnitude.

Nevertheless it is demanded, and we must face the fact that care after birth can never quite undo

the mischief that may have been wrought during intra-uterine life.

France has been more energetic in tackling the problems of infant life than we have. Thirty years ago a society, entitled the Society for Nursing Mothers, was founded, and in this space of time it has been effectual in saving the lives and improving the health of many thousands of infants, a result of more importance to France, probably, than any country to-day.

Fourteen years ago a refuge was started where destitute married women and single women expecting to be mothers could be received for a time, prior to their entering the maternity hospital. This line of work was extended with good effect, and about 10,000 mothers have availed themselves of the aid of the Society in this particular.

Probably it was this experience, together with the recognition of the necessity for such institutions as these "Refuges," which prompted the Royal Commission enquiring into the decline of the birth rate and the mortality of infants in New South Wales to suggest, in their report of 1904, the establishing of pre-maternity hospitals.

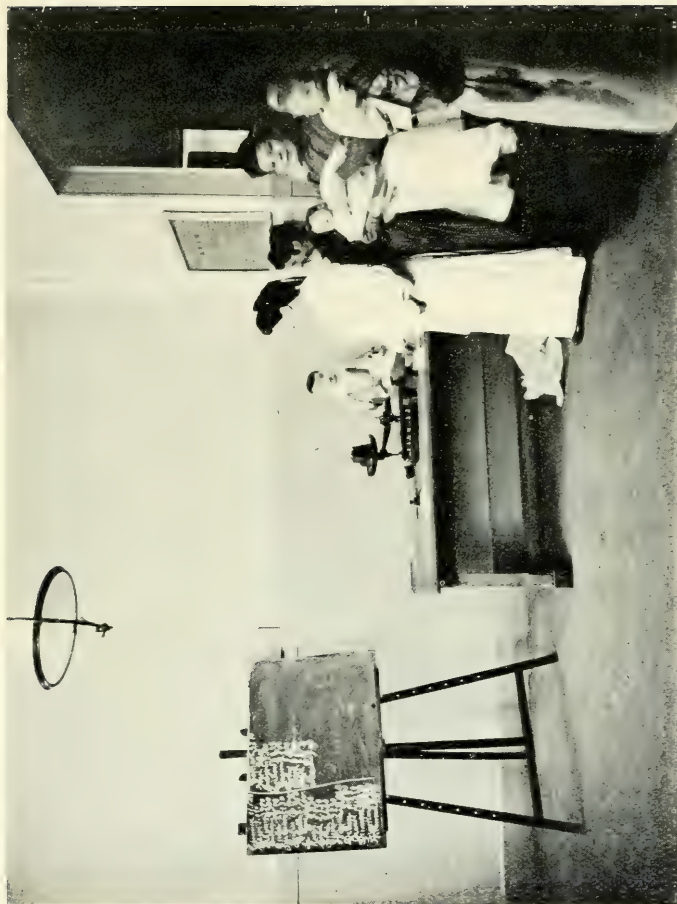
There are maternity hospitals in but few of our towns, the General Hospitals will on occasion grant beds, and Workhouse Infirmaries have, in most places, beds for this purpose. In the latter institution in Ipswich, between 1899 and 1903 there were 48 confinements; four of these were of married women, the remainder illegitimate births;

from 1903 to June, 1906, 41 confinements—26 were illegitimate births.

Apart from these provisions there is little done for our poor mothers at these times. Maternity charities abound, but the majority are totally inefficient. In the first place, very many turn the cold shoulder on the mothers of illegitimate infants; this is done with the idea of discouraging vice, but the pertinent enquiry that we may address to the institutions that adopt this line of action is, that as maternity charities exist not only for the purpose of assisting the mother at a difficult time, but also in the interest of the infant, is it right to subject the offspring of one who is not married to the greatly increased risks of suffering and death which statistics show us are associated with one so born? A continental worker in this field, whose efforts on behalf of the infant have justly earned for him world-wide recognition, thus addresses the writer :—

“I have seen with delight that you approve of making no difference between the married and unmarried. There are people who do not understand this and reproach us with encouraging vice, but at any rate the little baby who is born, and who certainly has not asked to be born, has nothing to do with the result of the affair itself. It comes new into life, body and soul, it thinks of nothing, has no idea of right or wrong, it asks nothing but to live! Well, let it live!”

In the next place, the help given is totally inadequate. This is due in part to the number of



WEIGHING THE BABY AT THE CLINIQUE TARNIER (PARIS).

small local charities, which, if re-organised, broadened in the extent of relief and administered for the necessitous, would produce far greater and more satisfactory results.

Lastly, the charities are to a certain extent a failure, in that *the infant* does not receive the share of attention at their hands it deserves. A great deal might be done by these agencies in educating the mothers as to the bringing up of the infant, and if each mother and infant who receive any attention from the charities were kept under observation for a few months many illnesses and early deaths, the results of ignorance, might be averted.

With the purpose of ascertaining the value of maternity charities in a progressive provincial town, the writer addressed the following questions to all the religious and social organisations in Ipswich which might have an interest in this matter. As the subject is one of great importance the replies are given *in extenso*.

A. Have you any system of aid for poor women during confinement? If so, please specify the character of this aid.

B. What is the average number of women so aided each year?

C. Does the woman contribute towards a maternity fund? If so, how much?

D. Is the aid limited to married women?

E. Can you offer any suggestions upon this matter?

No.	A.	B.	C.	D.	E.
1	No . . .	—	—	—	—
2	No; no poor in the parish.	—	—	—	—
3	Yes; maternity bags, which are lent for a month. "Infant Charity" tickets and "Lying-in Charity" tickets are also given away. (See end of list.)	12-14	is, is paid for the lying-in tickets, which is returned when the things are brought back.	Yes . . .	No; we have considerable difficulty with the maternity bags; have lost one or two through women leaving or disposing of the articles.
4	Yes; maternity bags, which the women much abuse. District visitors give small monetary help.	Cannot say.	No . . .	Yes . . .	We need help to furnish more bags.

5	No; the parish is very small, and nearly all are old or middle-aged women.	—	—	—	—
6	Yes; loan of a bag of clothing for one month, 1s. 6d. at the birth, 1s. if the bag is returned quite clean and in order, three meat tickets, a packet of oatmeal and $\frac{1}{2}$ lb. soap.	24, but increasing.	Not less than 2s. 6d.; more if possible (which is returned on the birth of the baby).	Yes, and not for the first baby.	We insist on three months' notice, and encourage strongly the deposit of savings.
7	Yes; lying-in bags.	6 or 8	No	Yes	—
8	Yes; a maternity bag is lent to poor women for a month, to be returned ready for use and in a clean condition.	About 2.	No	No; but not aware of any application from the unmarried.	—

No.	A.	B.	C.	D.	E.
9	Yes; three maternity bags containing sheets and personal linen for mother and child.	Cannot say; the bags are always out.	No . . .	Unanswered.	—
10	Yes; bags of linen, which are lent free to every applicant in the parish.	Very few; perhaps 4.	No . . .	No . . .	—
11	Yes; two bags of clothing, which we lend.	15 to 20.	No . . .	Yes . . .	We find our system very unsatisfactory. Bags are kept over time and returned unwashed.
12	A maternity bag, which we lend, and two "lying-in charity"	About 4.	No . . .	Yes, certainly.	We would wish to see more subscribers to the "Lying-in

Charity" among
the laity.

13	tickets each year. Two maternity bags, with a small gift of money. Very poor cases are seen that they have sufficient food.	5	Not as a rule .	The case has only once arisen, when it was refused; but there is no rule.	—
14	Yes; bag of linen, a packet of oat- meal; 1 lb. of mutton per week for three weeks; ½ lb. soap to wash the linen before returning; 1s. if the bag is re- turned in good order in the fifth week. Help is only given to a woman if she is recommended by a subscriber, who pays 5s. for each ticket.	13	At least 2s. 6d.; more if she likes, to be paid in not later than one month before the confine- ment. This is returned at the birth with 1s. 6d. added.	Yes, and not until the birth of the third child.	—

No.	A.	B.	C.	D.	E.
15	Maternity bags to supply the necessary linen for baby and mother are lent.	12	Is.	Yes . . .	—
16	Bag of linen, lent to each.	4	No . . .	No . . .	No.
17	No system of aid.	—	—	—	I have been here only a few weeks, so could not express any reliable opinion as to the need. If there is anything I can do to help, I shall be pleased to do it.
18	Yes; a maternity bag.	Cannot say.	No . . .	We would keep both.	No.

19	Maternity bags of clothing, a grocery ticket for a small amount, and a trifle in money if the bags are returned clean.	Numbers vary.	Women are encouraged to save. If it reaches 5s. the sum of 2s. 6d. is given them as bonus.	Yes.	—
20	No . . .	—	—	—	—
21	No system. If any-one belonging to us is in special need at such a time we help them from a poor fund which we have in connection with the church.	Cannot say.	No . . .	Unanswered.	—
22	Yes; a bag of linen for mother and infant, lent for a month, and 2s. in cash.	Perhaps 40 to 50.	No . . .	Only respectable married women are helped.	—

No.	A.	B.	C.	D	E
23	Two maternity bags.	3 or 4	Our women pay into a maternity fund, and their contributions are augmented by our funds.	Yes, and only members of the Mothers' Meeting.	—
24	Yes; our Dorcas Meeting provides a bag of linen and requisites for confinement, which are lent for one month; is worth of grocery is given at the time; a visitor afterwards gives another is; and if the bag is returned promptly and in good condition, another is. is	8	No . . .	Yes . . .	It is unfortunately abused, several of the cases proving disreputable and careless, and we often have trouble in getting the bag returned.



"GOUTTE DE LAIT," DIJON.—A CONSULTATION.



"GOUTTE DE LAIT," DIJON.—LEAVING.

[Facing page 126.]

25	given. Total in money and grocery, 3s.	—	—	—	—	—
26	No; but the matter is receiving consideration.	—	—	—	—	—
27	No system of aid, but help is contributed to needy cases by members.	—	—	—	—	—
28	No A bag containing linen required for mother and child for one month.	—	No record.	Yes; 5s., to which is added 2s. 6d. from the funds of the Mothers' Meeting.	Yes	—
29	No system. We have a poor fund, from which we help any person in any kind of need.	—	—	—	—	—

No.	A.	B.	C.	D.	E.
30	Two maternity bags are lent out for a month, and in case of want 2s. worth of milk or beef tea is allowed for a fortnight.	12	No . . .	Not been faced with the difficulty.	—
31	Yes; five maternity bags are lent out for one month and 1s. worth of grocery given.	24	No . . .	We have only been asked by married women or those living as such.	I think it would be a good plan for our Mothers' Meeting to encourage the women to save money beforehand and then double the contribution. I should like to have a lady health visitor.

32	A maternity bag and linen are lent to such as apply.	36	No . . .	Yes . . .	I think a charge should be made.
33	Maternity bags and aid from our "Poor Fund" and "Lying-in Charity" tickets.	Six with bags and about six with "Lying-in Charity" tickets.	No . . .	No . . .	—
34	Sets of linen are lent; "Infant Charity" tickets given. Also nourishment.	50	No; we take the very poor.	Yes, absolutely.	Thorough investigation is needed for every case.
35	Unanswered.	—	—	—	—
36 (Lying-in Charity.)	Loan of a bag, 5s. towards a doctor's fee, and 3s. 6d. for a nurse. Subscribers of 10s. are entitled to one ticket.	Varies with the subscriptions, probably about 90.	No . . .	Yes, and not for the first child.	—

No.	A.	B.	C.	D.	E.
37 (Infant Charity.)	Clothing for the baby. Subscri- bers of 5s. have one ticket.	115	—	—	—
38 (Nurses' Home and District Nursing.)	Bed linen and underclothing supplied in cases of extreme poverty, also tickets for milk. Our midwives' fees are remitted if too poor to pay.	About 80 aided (260 is the aver- age num- ber at- tended by our mid- wives.	If doctor attends a donation is asked from the patient if means permit.	Twenty unmar- ried women applied last year, 12 were attended. It is felt that such lapses from morality should bring in their train expense and responsi- bility.	The State should take over illegi- timate infants for two years, the father and mother to pay towards or en- tirely for the support.

A striking fact in the above returns is, that the charities in Ipswich are brought in touch with at least 600 mothers in each year; and one feels, therefore, how powerful an influence over posterity they might wield were each case followed by them and each infant kept under observation for at least the first three months of life. In 1905 there were born in Ipswich 1,955 infants, so that nearly one-third of these were either "expected" by the charities or known to them within the early hours of life. What valuable sources of knowledge of the conditions of infant life, and what splendid opportunities for good, could thus be afforded to an organisation on the lines of the Huddersfield Public Health Union — with its large number of voluntary lady helpers, which keeps each infant under observation for twelve months.¹

Slight comment upon the answers to Question D need be made. With the exception of that numbered 30, all the answers from No. 1 to No. 35 were received from religious organisations.

A large share of attention is here given to local institutions because they serve as types of the maternity charities usually found elsewhere.

About one-tenth of the infant deaths occur within forty-eight hours of birth; this fact suggests the necessity of advice being given to mothers and

¹ In most German cities every poor woman at childbirth is visited by a voluntary worker, and every attempt is made to induce the mother to nurse her child.

nurses, and supervision exercised over the infants as soon as possible after birth; for after allowing a large proportion of deaths from causes ante-dated to the birth there remains a huge wastage from avoidable post-natal causes.

The earliest official intimation of a birth is given at the registration of the same.

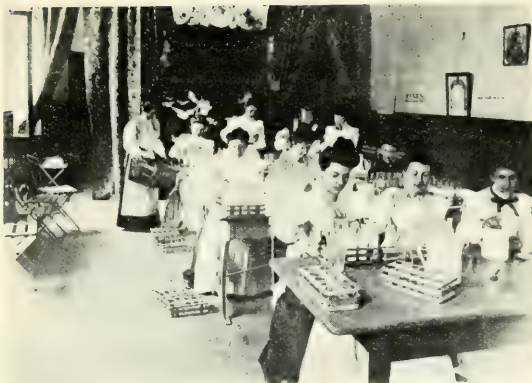
In England and Wales and Ireland registration of a birth can be effected at any time within forty-two days of the occurrence, and in Scotland within twenty-one days.

It does not surprise one, therefore, to be told that the registrations of an infant's birth and death are not uncommonly effected at the same time.

Our period of time allowed for registration of a birth is exceeded by New Zealand, Tasmania, Western Australia, Queensland, Victoria, New South Wales, and in Canada by British Columbia and Quebec. In all these, it is sixty days, with the exception of New Zealand, which allows an interval of sixty-two days, and Quebec four months, unless the child is baptised.

South Australia and the Cape of Good Hope allow forty-two days; Orange River Colony, Natal, Ontario, Manitoba, the North West Territories (Canada), and Cyprus, twenty-eight to thirty-one days; Gibraltar, twenty-one; Newfoundland, fourteen; and Malta, five days.

In America we find that notification or registration of a birth is required within the following



"GOUTTE DE LAIT," DIJON.--FILLING THE BOTTLES
READY FOR DISTRIBUTION.



"GOUTTE DE LAIT," DIJON.--STERILISING THE MILK.

space of time :—Florida, immediately ; Nebraska, New Hampshire, North Dakota and Maine, three to six days ; Colorado, Minnesota, South Dakota, Iowa, Vermont, Michigan and Pennsylvania, six to ten days ; Connecticut, New York, New Jersey, Texas, West Virginia and Illinois, twenty-eight to thirty days.

Rhode Island, Massachusetts, California and Washington require physicians and nurses to keep a register and to report all births attended by them during a month, the report to be made early in the succeeding month.

Washington and Massachusetts require in addition that if no physician or nurse be present parents must register the birth, in the former State within thirty days, and in the latter within forty days.

Arkansas, Georgia, Tennessee and Missouri have not a registration law.

On the Continent we find that Belgium requires registration in three days after birth ; Denmark within two days for town births, and eight days for country births ; Germany, within one week, but if a still birth or if the infant died at birth notice must be given the following week-day ; Holland, within three days ; Italy, five days ; Switzerland, three days ; and France, within three days, exclusive of the birth-day.

France requires in addition that every child must be "presented" before "le Maire de la Commune de l'accouchée" during this interval,

who satisfies himself as to the sex. The law, not wishing "to complicate matters," allows the three following forms of presentation.

(1) If the distance is not too great, and the weather favourable, the infant must be presented to the Maire at the Mairie.

(2) Where the distance is too great, as for instance, outlying districts of a city, spreading out provincial towns and in hamlets in general, the law has established a corps of doctors known as "*Médecins de l'état civil*," paid by their respective Maires, whose duty it is to visit the "*accouchée*" in person, to see and investigate the sex of the child. These officials draw up the "*état civil*" of the child, sign the same and send it to the Maire.

(3) Where the distance is too great for presentation of the child at the Mairie, and the local authorities too poor to afford the up-keep of a "*médecin de l'état civil*," then only will the law accept as valid the certificate of birth from the private doctor or midwife in attendance.

Beyond these three days' interval after birth no presentation of the infant or signed birth certificate is valid, and the penalty for so infringing the law is demanded.

For thirty years the above requirements have been demanded from rich and poor alike.

By a local Act which came into force November 1st, 1906, Huddersfield requires that the father of the child, or in his absence any person in attendance upon the mother either at the birth or within



FOR THE :541612.

COUNTY BOROUGH OF HUDDERSFIELD.

The Mayor's Infantile Mortality Fund.

SELECTED DISTRICT.

100

Nov. 11, 1904

[illegible]

THE GOLDEN RULE.

[illegible]

"Feed with the Mother's Milk:

The Mother's Milk is the natural food AND THE BEST."

Twelve months after date I promise to pay to the Parents or Guardians of the above-named child the sum of One Pound on production of proof that the said child has reached the age of Twelve Months.

400-1700

Major of Haiden[illegible]

SEE BACK OF THIS CARD FOR OTHER RULES

THE CARD ISSUED UNDER ALDERMAN BROADBENT'S SCHEME.

six hours of it, shall, within forty-eight hours, give notice of the birth to the Medical Officer of Health.

Voluntary notification had been in force previously and the houses where births had occurred were visited by lady doctors. The success that attended this movement led to the inclusion of the above clause.

In the latter part of 1904, Mr. Benjamin Broadbent, Mayor of Huddersfield, instituted a scheme, somewhat on the lines of Villiers le Duc and Leipsic, in the Longwood district in his town. He promised to pay £1 to each baby which completed its first year of life. This promise is made on a neatly arranged card, which bears the name of the child, date of birth, and name and address of the parents.

A committee of ladies visited the homes and took individual interest in each of the "Mayor's babies," and marked success has followed. The first year saw a reduction in the infantile mortality of that district from 134 to 54 per 1,000.¹

The Registrar-General, in his sixty-seventh Annual Report, quotes the French registration law, and comments upon it. He considers "it would be unwise at present to disturb the existing organisation of birth registration," and favours a system of early notification in conjunction with the present system of registration.

¹ A somewhat similar movement has been instituted recently in one of the London boroughs.

But it is not only in the interval after birth which is allowed for registering that our present system is faulty. It does not require the notification or registration of still-births. In the majority of the American States and in continental countries this is required.

In connection with the registration of births we find that some countries demand certain information which is not required by us, and some of this is of the greatest importance. The State of Michigan requires on registration, in addition to the ordinary information, the following: the number of children of the mother; the number of children then living; the age of the mother and her birthplace; the occupation of the mother, if any; the birthplace of the father and his age; the condition of the child as to live or still-birth, and if a still-birth, the cause. The answers to all these questions would provide a fund of valuable information, not only for the purpose of statistics, but also for indicating conditions favourable or unfavourable to the life and health of infants.

Reference may be made here to another legislative effort on behalf of the infants, this also in America; and its purpose is to prevent blindness in children, which not infrequently follows the neglect of the disease known as ophthalmia of the new-born.

Rhode Island and the State of Maryland have enacted that, "should any midwife or nurse, or person acting as nurse, having charge of an infant

in this State, notice that one or both eyes of such infant are inflamed or reddened at any time within two weeks after birth, it shall be the duty of the one so having charge to report the fact in writing, within six hours, to the health officer or some qualified practitioner of medicine." Penalty or violation is a fine not to exceed 100 dollars, or imprisonment not to exceed six months. The Secretary of State for Indiana, writing under date of July, 1906, says: "We think that about 25 per cent. of the blindness in this State is due to ophthalmia neonatorum," but all efforts to secure such a law as the above has failed for Indiana to the present.

We must turn to France for several object lessons in the means to combat excessive infant mortality.

One of the most interesting of these lessons is to be obtained in Villiers le Duc, near Dijon, where M. Morel de Villiers has tackled the important problem with a large measure of success.

A quotation from a letter of M. de Villiers to the author may be of interest:—

"The Municipal Decision of May 11th, 1903, relating to measures taken since 1893, that is to say, after an experience of ten years, had been drawn up relating to my district, where I could not dream of establishing a more complete work as I did in Dijon, with more than 70,000 inhabitants, last year. I am especially occupied in combating the infant mortality in the little villages, where the resources found in the larger towns do not exist. I have invented nothing; all that I say is already known; I only try to make

it more commonly known and regulate the means for bringing up the children. These simple means have given the following results. I have not lost a single child born alive in these twelve years. This observation refers to more than 100 children, of whom 8 per cent. were born in my village and the others in neighbouring villages, where they have asked my advice and kept my rules. Many of them have been attacked with serious illnesses. I have had them with scarlet fever, chest affections, pneumonia, croup: the children have resisted all and are now strong. The experience of twelve years is not long enough to prove it, but I believe that careful feeding during the first year—avoiding over-feeding—and carefully looking after weak organs, gives to the child a power of resistance which will enable it to resist attacks of disease. Concerning still-births, during the twelve years I have only had one.¹ I have now ordered that every midwife shall call in a doctor if a confinement is not over in twenty-four hours. I insist on every pregnant woman claiming municipal assistance, which is never refused, and on being examined by a midwife of her own choice at the seventh month, and the midwife must inform me of the results of her examination,' I then take necessary measures."

There are one or two interesting details which must be given. Prior to 1893, for several decades the infant death rate of Villiers le Duc varied from 130 to 280 per 1,000 born, and neighbouring communes where such a "Municipal Decision" is not in existence, have to-day a mortality of 120 per 1,000 births and upwards, and the proportion of still-births is unaltered.

We will now outline the articles of this "Municipal Decision" of Villiers le Duc, drawn up with

¹ This was at a confinement attended by a midwife, who allowed it to continue unaided for seventy-two hours.

the recognition of it being "the duty of municipal authorities to prevent the depopulation of the country by taking the measures necessary to prevent still-births, mortality at birth and to prevent infant mortality."

Article 1.—Every married or unmarried woman who is pregnant, living in the village, without sufficient means to meet the expenses to ensure safety for herself and child, shall have the right to demand the help of the authorities.

Article 2.—To obtain this help she must make known her condition at the Mayoral office before the seventh month, and name the midwife by whom she wishes to be attended, and who shall examine her to ascertain abnormalities. For this visit the midwife is paid 4s. 2d. out of the "free medical aid fund" opened in the village.

Article 3.—If, after this examination, the midwife considers the attendance of a medical man is necessary, she must notify the same to the municipal authorities. The doctor's fees shall be paid out of the "free medical aid fund."

Article 4.—Every woman aided by the commune at her confinement shall, if she remains in bed, receive 10d. a day for six days, in addition to the day of the confinement; if she gets up under this term the money is not paid.

Article 5.—Every woman taking in a child to nurse, unless wholly fed at the breast, must provide an apparatus to sterilise the milk, and must follow the instructions issued by the municipal authority.

Article 6.—Every infant placed out to nurse shall be weighed fortnightly on the communal baby-weighing machine. The weight shall be entered at the office.

Article 7.—Every nurse child, whether breast or bottle-fed, if attacked by any illness must be notified to the municipal authority within twenty-four hours of the outset.

Article 8.—If nurses do not conform to Articles 5, 6, 7, their certificates of qualification may be withdrawn.

Article 9.—Sterilising apparatus shall be placed in the office of the municipal authority for disposal to nurses at a reduced price. Mothers in a state of poverty shall obtain without charge the use of a sterilising apparatus, to be returned when the child is weaned.

Article 10.—Every one bringing up her own child or one entrusted to her care, by breast or bottle, and who produces the child in good health at the end of one year, shall be entitled to a grant of 2s. per month from the time first nursed by her.

The results attained in Villiers le Duc demonstrate what wisdom and foresight in these matters may achieve. Local effort could in England do this, at all events in the country towns and villages, with very little expenditure of money. That even the low figure of infantile mortality which obtains in the county of Dorset is excessive and could be substantially reduced is evidenced by the fact that in at least three of the

registration districts premature births were responsible in 1903 for 43, 50 and 62 per cent. respectively of the whole infantile mortality, and of 20·8 of the total infant deaths in the county; and in one district in the same county "debility" was the cause of 91 per cent. of the infant deaths.

Dr. Vildermann, in 1895, when at the Bureau de Bienfaisance, Paris, wrote a letter entitled "A practical way for reducing the Infant Mortality among the Poor classes in Paris," in which he suggested that great value would accrue if the city subsidised a milk supply for the infants, and after referring to the large number of children which died from preventable diseases, he said that the cost of this movement would be more apparent than real, inasmuch as "the children nourished on adulterated or infected milk will cost you sooner or later a great deal of money," and in justification of his policy he said: "See for yourselves if it is not more advantageous to spend some money on hygiene for the children to make them healthy and vigorous subjects, than later on to spend money in caring for them as invalids." Speaking of bottle feeding in Paris, and the necessity for extending control over the artificial feeding of infants, he said: "Artificial feeding can be quite excellent, but as it is actually practised among the poor classes it is absolutely murderous."

Ten years later Dr. Vildermann, in correspondence with the author, writes:—

"Since publishing my booklet of 1895 enormous

strides have been made toward the rescue of infants. The town of Paris has instituted numerous dispensaries and consulting rooms for infants, where they are examined by the doctor every day and where sterilised milk is given free to children as well as monetary help to the mother in poor cases. Besides this, philanthropic societies have instituted numerous dépôts, where pure milk is sold at 20 centimes and sterilised milk at 40 centimes the litre. Whereas the infant mortality with us used to be 9,000 per annum, it has now (1905) fallen to 6,500, and we look for still greater progress."

To Professor Budin¹ must be given the credit of putting into practical shape a means of reducing infantile mortality through the medium of the "Consultation de Nourrissons," and the lines upon which he started this crusade at the Charité Hospital in 1892 were: (1) to encourage breast feeding by all available means; (2) to give sterilised milk when natural feeding is impossible, or to assist the feeding of the child when the mother's milk is insufficient; (3) to see the infants every week or fortnight until they are two years old. There are now upwards of thirty of these institutions in Paris alone. In the Department of Pas-de-Calais seventy-one were in existence in 1904: these had become 189 in 1905, and at least thirty-three more will be founded this year.²

Originally founded as an annex to the

Now at the Clinique Tarnier, Paris.

"Des Consultations de Nourrissons, Leurs Résultats"
(Dr. P. Budin), *L'Obstétrique*, July, 1906.

maternity hospital, the system has been extended in connection with dispensaries and charitable organisations.

Quite independently of the work undertaken in Paris by Professor Budin, another worker, Dr Léon Dufour, of Fécamp, in 1894 faced the necessity of supplying artificially-fed infants with modified cow's milk, and he founded, what he termed, the "Goutte de Lait." The two terms, "consultation de nourrissons" and "goutte de lait," are now often used for the same institution. Thus of the work at Dijon, which is quite of the character of a "consultation de nourrissons," the founder says: "The charming name of 'Goutte de Lait' was given by Dr. Dufour, and we have kept it, if only from a feeling of sentiment."

As a type we may refer to the working of the Dijon "Goutte de Lait." In this institution—and in certain others in a varying degree—one fact impresses us most deeply, the extent of the voluntary help afforded by women, which is one of the forces responsible for the splendid results which have so far attended the work at Dijon. M. de Villiers, speaking at the "Goutte de Lait" Congress in Paris, in October, 1905, said of the Dijon centre:—

"Our female officers, whose devotion is untiring, come from all parts of the town; over sixty ladies have graciously offered several hours of help every week. Sceptic spirits predicted that we could not reconcile women in different social stations. They were wrong. They did not recognise the condition of a woman's

soul, to whom to evoke the notion of a child is enough to scatter all idea of caste."

As to the details. The milk is obtained from healthy cows, which are kept in spacious, well-lighted and well-ventilated stables, grazing in good pastures when the weather permits.

The milk, as soon as possible after being drawn, is placed in vessels which are hermetically closed, sealed and then dispatched to the "Goutte de Lait."

Each infant attending has a special diet chart indicating the modification of milk needed and the number of bottles to be prepared for it daily, a sufficient number being placed in a basket to last for twenty-four hours.

A doctor is present each day to examine the infants and write out prescription sheets. The babies are regularly weighed and a record of the weights is preserved.

Another important action of the Dijon "Goutte de Lait" is the inaugurating of a school where future mothers are taught "the art of caring for and bringing up children."

The value of these institutions is indisputable, and a few examples of the success attending their efforts may be quoted.

At Varengeville-sur-Mer a "Consultation de Nourrissons" was founded in 1904; the summer of this year was as trying as that of 1898, and in the latter year the infant mortality was 285 per 1,000, but in 1904 it was reduced to 77. The average of

seven years prior to 1904 showed an infant mortality of 145 per 1,000 births.

At Sens, one was founded in 1904. The infant mortality fell to 80 in that year, and to 47 per 1,000 in 1905; the average prior to 1904 was 116.

In Villeneuve-sur-Yonne there was founded a "Goutte de Lait" in 1904. In 1898 the infant mortality was 163 per 1,000 births, in 1904 it fell to 82 and in 1905 to 37 per 1,000. In three neighbouring communes, where there was not such an institution, the infant mortality was 117, 163 and 176 per 1,000 births respectively.

The good results that have been associated with the work of these institutions is not limited to the reduction in infant mortality. One of the purposes is to encourage breast feeding. Dr. Ausset found when starting his "Consultation de Nourrissons" that 22 per cent. of the infants were breast fed; in two years this proportion was increased to 77 per cent.

At Varengeville-sur-Mer prior to the starting of the institution it was difficult to find one woman who gave her baby its natural food; last year 75 per cent of those attending the consultation nursed their babies.

In connection with the municipal dispensary in Rouen, it was found five years ago that nearly all the infants were fed artificially; to-day upwards of two-thirds of the mothers nurse their infants. It is interesting to note that the municipality of

Rouen allows to all needy mothers who nurse their babies, three pounds of meat per week.

Professor Budin has succeeded in inducing 95 per cent. of the mothers who come under his care to nurse their infants. Such a result is most encouraging, for, as this pioneer truly observes, the best "*goutte de lait*" is that which the infant should find in its mother's breast.

The Society for Nursing Mothers—to which the writer has already referred in regard to its work among those who will shortly be mothers—interests itself in ensuring help for needy cases so that the mother may nurse her baby. Every case is watched by a lady visitor during the first year of the infant's life, and the little one is weighed and examined each month.

This work has been carried on for nearly thirty years, and the Society has interested itself in over 40,000 children during this time.

The writer has elsewhere insisted upon the inevitable association of unsatisfactory results from breast feeding with the underfeeding of the nursing mother. In this connection it is therefore interesting to note that two years ago Paris saw the opening of an institution where, in the morning and evening, nursing mothers could have a free meal.

The names of M. and Mme. Coulettt are associated with this interesting and important movement. There are now six of these institutions in Paris.

The success of the "Goutte de Lait" in Fécamp and other towns in France led to Brussels inaugurating one in 1897, and since then this institution has been copied by many Continental cities and towns, the majority of which adopt in full the methods of Dr. Dufour.

CHAPTER VII.

EXISTING AND REQUIRED AGENCIES

(CONTINUED).

A YEAR before Dr. Léon Dufour founded his "Goutte de Lait" in Fécamp, the Hon. Nathan Straus inaugurated in New York a system of supplying infants with a pasteurised and modified milk supply. This was in 1893; and the appreciation of this system is evidenced in the distribution of 1,300,000 bottles of the milk in six months of this year.

Mr. Straus emphasises the need of such an undertaking in the following words, which he used publicly last year :—

"As there is a fractional loss on every bottle of milk sold, taking no account of the thousands distributed to families which are unable to pay for them, it is obvious that the work in which I am engaged must at the present rate of expansion shortly transcend the bounds of private effort. I contemplate the time with dismay when any organisation which I am able to provide will be inadequate to supply the demand. I can only trust that before that time arrives the city itself may be prepared to accept the obligation, which no other agency can so well discharge, of making a supply of a wholesome milk food for infants a municipal function, and so stamping out the seeds of a plague more destructive than any



"GOUTTE DE LAIT," DIJON.—WASHING THE BOTTLES.



"GOUTTE DE LAIT," DIJON.—WEIGHING THE
BABIES. (*M. Morel de Villiers to the left.*)

[Facing page 148.]

that is to be dreaded under the condition of our modern civilisation."

In New York the months of June, July and August levy the heaviest toll on infant and child lives ; therefore it is interesting to see the reduction in the general death rate for children under five years of age at this period of the year, which has followed the opening of Mr. Straus' milk depôts.

Years.	Death Rate of Children under Five Years of Age per 1,000 Living during the Months of June, July and August.
1891	126.0
1892	136.1
1893—8 (first depôt opened, 1893) . .	105.0
1898—1904	74.4

Of course, during these years there have been sanitary improvements in the city, but a large proportion of the credit for this saving of life must be given to the Straus milk depôts, both directly by their supply of clean milk and indirectly by the improvement in the commercial milk supplies which the competition of the depôts has necessitated.

Four years later, in 1897, Rochester in the State of New York began to control a portion of the public milk supply, and marked success has attended this work.

Each milk centre is under the care of a nurse ; and the movement is recognised there as being of

double value, serving as a means of supplying infants with pure milk and also as exerting a strong educative influence on parents and milk dealers.

Dr. Goler, the Health Officer of the city, who has been responsible in great part for the movement, corresponding with the author, expresses his views in the following words:—

“Relating to the control which municipalities should exercise over the milk supply, I believe our conditions in this country are a little different from the conditions with you in this respect. Here the municipality seek, for the present, a control of a part of the milk supply for educational purposes only. We have, so far as Rochester is concerned, for years striven to give up our milk work could we have found a sufficient number of milkmen to go into the business and to supply milk to children both clean and at a low cost. Up to the present time, we have been unable to find such a number of milkmen as we desired. Of course, as time goes on we shall see the necessities of life controlled not by private individuals, but by the State for the good of the citizen.”

Prior to 1897 the infant mortality of Rochester was very excessive, and particularly so during the summer months. During the summer of 1897 the Health Commission of the city sanctioned an expenditure of £80 to provide a milk station where pure milk in bottles could be sold for infant feeding during July and August. A station was opened the first week in July under the care of a nurse from the City Hospital, and the milk was supplied to the mothers at cost price. In the first instance the mother brought the infant to the

station and the nurse would impress upon her the value of breast feeding ; if hand feeding was practised, then the child would be weighed and the nurse would instruct the mother in the proper method of feeding, varying the modification of the food according to the weight and not the age, and would also give her instructions in general hygienic measures.

Booklets of information as to the care of babies, printed in English, German, Italian and Hebrew, were given away.

In four weeks a second station was established in another part of the city under the care of a nurse from St. Mary's Hospital. Both these stations were worked until September 1st, on which date they were closed.

What were the results which attended this experiment? In July of that year 50 children under five years of age died, and in August 57 ; the average of six years' child mortality during these two months was 112 and 99. At the end of 1897 it was found that 200 fewer children had died than in the previous year, and 125 fewer than in any year of which there was record.

In 1898 four stations were opened, each under the care of a nurse from the hospitals in the city. The central station is organised each season on a farm outside the city. Dr. Goler thus describes it :—

“At the Central Station a trained nurse and her assistants have control of the cows, utensils, bottles, etc.,

and all the milk work is carried on in a portable milk laboratory. Everything coming in contact with the milk is thoroughly sterilised in steam sterilisers. The milk itself is not subject to any pasteurising or sterilising process.

"At the milk station on the farm the milk is taken from clean, well fed, tested cattle, into sterile cans which are carried to the barn in sterile cheese cloth bags. Just before milking the cows' udders are washed, and the first portion of the milk is rejected. As soon as the cans are filled they are immediately covered by a large cheese cloth, held in position by a rubber band. They are taken immediately into the laboratory about 200 yards away, where the milk is properly diluted, sweetened and turned off into sterile nursing bottles of various sizes. The bottles are corked with sterile rubber corks, placed in racks, covered with cracked ice and immediately transferred to the city for use. Of the cleanliness of milk prepared in this way, 43 daily samples were found to average not more than 14,000 bacteria per c.c., while the city milk for the same period approximated 250,000 bacteria per c.c.

"The cost of distributing this milk, and, what is far better and more important, spreading abroad some knowledge of the care and feeding of infants, has averaged less than £180 per year. This is an example of what may be done to prevent infants from dying needless deaths from dirty milk. The success of this plan is not dependent so much upon the amount of milk sold at the milk stations as it is upon the educational factor in the work, upon the knowledge imparted to the mothers by the nurses at the stations, and by the work of the Press. The success of this plan too has largely depended upon the system of milk inspection. Stable inspections were carried on in all the surrounding towns supplying Rochester with milk."

Yonkers, Buffalo, New York, and other cities in

America, have undertaken similar movements with corresponding success.

Coming to Great Britain, St. Helens founded a municipal milk dépôt in 1899; this followed a visit paid by a committee of the Town Council to the "Goutte de Lait" founded by Dr. Dufour in Fécamp. A similar movement was undertaken by Liverpool, 1901, in the next year by Battersea, and later by Dundee, Glasgow, Leith, Dunkinfield, Ashton-under-Lyne, Bradford, Burnley, Woolwich, Lambeth, Leicester. In York a "Health and Housing Reform Association" undertakes a somewhat similar task, in Finsbury a "Social Workers' Union," and a "Pure Milk Association" in Leeds.

The work in the English milk dépôts is conducted in a different manner to that in the French "Goutte de Lait" and "Consultation de Nourissons." The system pursued at Finsbury, however, copies more nearly that adopted in France.

Illustrating the English system as generally adopted, we may refer first to the Liverpool milk dépôt. Before doing so, however, we must note that the Liverpool Corporation Act of 1900 contains clauses which enable the Public Health staff to exercise a wide control over the milk traffic, including the conditions under which the milk is obtained from outside sources, and beneficial results have followed these increased powers.

As Dr. Hope, the Medical Officer of Health for Liverpool, says, "Nothing is omitted which can

lessen the dangers of contamination to the milk in its many vicissitudes on its way from the cow to the consumer."

Very efficient control of the milk supply is particularly necessary when a municipality undertakes the supplying of milk for infants, inasmuch as pasteurising or sterilising of impure milk does not render it pure, or non-toxic.

In 1901 the city put into effect a scheme for the supply of sterilised milk for infant feeding, modified according to the requirements of the child. This milk is sold at depôts, and is also supplied to the public through ordinary dairymen.

Lady inspectors visit the homes where infants are fed on the milk, but it has been found a difficult matter to induce the parents to bring their infants to the dépôt at stated intervals for the purpose of weighing.

The milk is supplied at a charge of 1s. 6d. per week, paid in advance. Sufficient is placed in each bottle for one feeding, and the bottles are supplied to the mothers in baskets containing six, seven, or nine, according to the age of the child for whom it is purchased.

Among the regulations it is required that :—

"The person using the milk must guarantee to continue its use regularly during the needs of the child."

"Should the milk not be agreeing with the child, the matter should be reported at once."

"Every person using the milk will be supplied

with two teats, which must be kept clean, and brought to the depôt for inspection at least once a week."

In four years' work of the Liverpool scheme upwards of 9,000 infants were fed on the milk, nearly 6,000 of whom came to the depôts; the remainder were supplied from the dairies. Of those who were brought to the depôts in various conditions of health the mortality was 89 per 1,000 as against 251 to 281 in the worst parts of the city, and 133 to 138 per 1,000 in the best parts.¹

In the Battersea Health Report, 1904, Dr. McCleary, then the Medical Officer of Health, published a memorandum for the information of those interested in milk depôts. The following is an extract from that memorandum :—

"In June, 1902, the Battersea Borough Council opened a depôt for the supply of specially prepared milk for infants whose mothers were unable to suckle them.

"The milk is obtained from a herd of tuberculin-tested cows on a farm which is from time to time inspected by the Medical Officer of Health. Shortly after being drawn from the cow, the milk is strained and cooled down to 40° F., and is sent direct to the depôt in sealed churns."

Then follows a list of the conditions under which the milk is supplied by the contractor; some of the clauses the writer will quote :—

"The milk and cream must be free from chemical preservatives or colouring matter and be drawn from

¹ Health Report, Liverpool, 1904.

healthy cows only. A warranty ticket must be attached to each churn. The cows shall during the summer be pastured, and during the winter so fed that no taint is imparted to the milk; the contractor undertakes to use no brewers' grains (wet or dry), turnip tops, or vetches. The milk shall be delivered at the Council's Milk Depôt at a temperature not higher than 56° F. From June to September, inclusive, the contractor, when required by the Medical Officer of Health, shall pasteurise the milk before delivery."

After the milk has reached the depôt, it is strained, modified to suit the various age requirements, and bottled. The bottles of milk are placed in the sterilising chamber, and the temperature raised to 212° F., and maintained at this for about ten minutes. On removal from the chamber the bottles are placed in a cooling tank.

For children living in the borough the cost for a week's supply varies, according to the age of the child for whom it is purchased, from 1s. 6d. to 2s. 6d. per week; for children living outside the borough from 2s. 3d. to 3s. 3d., payable in advance in either case.

A very important provision in the Battersea scheme is that arrangements have been made with the Board of Guardians, by which the relieving officers are empowered to issue orders on the depôt in lieu of giving money in outdoor relief, and a similar system has been adopted in connection with the various local charitable organisations. The Finsbury depôt has also



WAITING TO SEE PROFESSOR BUDIN.

[Facing page 156.]

arranged with the Guardians to supply milk as out relief.

In Battersea it was hoped that the mothers would bring their children to the depôt to be weighed at stated intervals, but Dr. McCleary says that it was found impossible to enforce this, and it seemed as if there was a prejudice against baby weighing. A lady inspector visits the homes of all the children fed from the Battersea depôt.

The Finsbury milk depôt, a voluntary association's effort, more nearly approaches the Continental "Goutte de Lait" in its method of working. No infant is supplied from this depôt unless it is regularly weighed, and is examined by one of the medical staff at least once a fortnight.

The milk is obtained from a herd of Jersey cows, each of which is tuberculin-tested once a year; if one responds to the test it is immediately eliminated from the dairy herd.

The modification, pasteurisation in winter, and sterilisation of the milk in the summer are undertaken at the farm.

"The commencement of the Social Workers' Association furnished the occasion for the establishment of the Finsbury depôt, and the work entailed was undertaken by a voluntary committee of medical men, assisted by some lady visitors. The object was to establish a depôt on a small scale, under proper control and on satisfactory lines, for a few children; the whole of the necessary funds were subscribed by a few friends of the enterprise.

"The principles by which the medical committee wished to be guided were—(a) absolute control of

the milk and avoidance of the serious fallacy of sterilising unclean milk; (b) medical supervision of the entire management of the dépôt and of the infants using the milk; (c) a discriminating and careful distribution of the milk, and only to infants who could not be breast fed; and (d) the systematic study of the effect of the milk on the children. The committee desire to make the method as individual as possible, and in no way to lessen the responsibility of the mother."¹

The price charged for the milk is fourpence a quart, and it is put up for sale in bottles in three modifications. If the child needs medical care the mother is advised to take it to a medical man or to a hospital. Each child fed from the dépôt is visited at home at least once a week, and "a direct personal influence is brought to bear on the mother"; to this, Dr. Newman attributes much of the success of the Finsbury dépôt.

The method pursued at Finsbury is interesting in that it is the nearest approach in this country to the French institutions, and it is a pity that all milk dépôts should not adopt a system that would fulfil the ideals of Professor Budin and Dr. Dufour.

In Leeds the "Pure Milk Association" aims at supplying mothers with a pure milk. It is obtained from a farm under reliable control, all care is exercised in the milking, and the cans into which it is drawn are sterilised. The milk is at once cooled and bottled. The bottles are either pint or 6-ounce size, one of the former or three of the

¹ Finsbury Health Report, 1905.

latter selling for twopence. The distribution is effected through the women inspectors.

Let us briefly recount what should be the aims of a perfectly equipped institution, the purpose of which is to deal with this special branch of preventive medicine.

(1) To encourage breast feeding and to give information to mothers on such personal measures as may have an important bearing on their ability to nurse their children.

(2) To supply cow's milk to those infants whose mothers are unable to nurse them, modified to suit the varying ages and weights, and obtained from healthy sources. This milk should be distributed in bottles, each of which contains sufficient for one meal; this lessens the risk of contamination and its results, and guards against under- or over-feeding of the infants.

(3) To keep infants, living under unfavourable conditions of life, under medical supervision during a most critical period.

(4) To educate the present and future mothers in the care of infants.

(5) To educate the public and the dairymen in the advantages and necessity of a pure, clean milk supply, and to demonstrate the simple precautions necessary to effect this.

Success has attended the American and British institutions—with few exceptions—in the more limited schemes they have adopted; the purpose of these has been, in the main, to improve

artificial feeding. France and other Continental countries aim primarily at increasing breast feeding.

It is not very pleasing to hear from Burnley that within two years of the establishment of a *dépôt* there for the supply of sterilised milk the demand for it gradually ceased, because it was too much trouble for the mothers to fetch the milk.

Woolwich, in connection with its *dépôt*, has arranged for the distribution of milk by wagon where the distance of the child's home from the *dépôt* might be an excuse for the mother not availing herself of it.

In the previous chapter reference was made to the restaurants for nursing mothers in Paris; the success of this movement has led to the Social Union of Dundee undertaking a similar work. Under this scheme two good meals are given each day at a cost of 1s. 6*d.* a week. A certain number of nursing mothers, if unable to pay, are given these meals free. In addition, necessitous cases, recommended by the maternity hospitals, are given free food for at least the last month of pregnancy.

Many public health committees, in their reports of the steps they have taken with the purpose of reducing infantile mortality, lay stress on the issuing of leaflets and pamphlets on infant feeding.

With few exceptions, such advice is an incentive to artificial feeding. In some of these publi-

cations breast feeding is not mentioned, in others we find the statement at the head, "All infants should be breast-fed if possible;" then follow many lines of advice on artificial feeding, often elaborate in detail, usurping the attention which should be given to the means necessary for ensuring a supply of breast milk.

The majority of these leaflets and pamphlets are of a stereotyped character, and as each local authority awakens to the need of doing something for its infants, it attempts to meet this by a few posters on "Infant Feeding" and "Diarrhœa," and a promiscuous distribution of leaflets. One authority copies from another, and the faults of the system are perpetuated—the majority of the useless publications lack even the saving grace of originality.

There are authorities who are distinguished by showing more consideration in this matter. They have recognised how important it is to encourage breast feeding by all means possible. They have seen the folly of parenting these publications, both on account of their nature and because of their promiscuous distribution.

A leaflet describing the methods of artificial feeding should never be issued by a Health Authority to a mother unless it is known that she cannot nurse her child or that it is inadvisable from any cause.

The distribution, by district visitors and social workers, of leaflets containing advice to those who

are to be mothers would be a wise undertaking. The advice does not need to be elaborate, in fact the simpler the better; stress should be laid on the value of plain and nourishing food, the avoidance of excesses, and the need of attention to the breasts before the birth of the child.

The mortality statistics which we have considered elsewhere show how much more valuable to the nation is the breast-fed than the artificially-fed child.

This happy expression from Dr. Sykes should be printed in letters of gold: "The only way to humanise cow's milk is to pass it through the mother, not through a machine."

Another type of institution more common in France than in any other country is the day nursery or *crèche*. France can boast of 400, England of 80. In the former country we find them: (a) founded and supported by private effort, (b) founded and maintained in whole or part by the *Société des Crèches*, (c) founded by the State, (d) founded privately or by a society, but supported in part by contributions from the municipalities.

Paris contributes annually about 180,000 francs as municipal assistance towards her *crèches*.

The first institution of this kind was established in Paris by M. Firmin Marbeau in 1844.

A *crèche* or day nursery cannot now be started in France without the authority of the Prefect of the district.

There have been three decrees and ministerial orders made concerning them, which require that :—

The fixed number of infants for each nursery must not be exceeded.

The cubic capacity of the rooms must be efficient.

The rooms must be well ventilated, and they must be heated sufficiently before the children are admitted each day.

Each child must have a cot of its own, distinguished by a number.

Toilet articles must be reserved for each.

No infant or child to be admitted unless a medical certificate is produced stating freedom from any contagious or infectious disorder.

One nurse must be provided for every six infants, and one for every twelve children between one and three years of age.

Each infant must be weighed weekly during the first year, and each child monthly from one to two years of age.

For children fed artificially the long tube feeding bottle is absolutely prohibited.

There are many day nurseries in Germany ; the first was established in 1877. They are supported : (a) by the municipality (very few), (b) by private effort, (c) founded by philanthropic societies with grants towards their maintenance from the municipality. There are no such legal provisions as in France.

In almost every country on the Continent there has been interest shown in the establishment of these institutions, although not to the same extent as in France and Germany.

In England the day nurseries are charitable undertakings, and are not aided by the municipality, nor has any special legislation been effected in regard to them.

Dr. Moore, the Medical Officer of Health for Huddersfield, addressed enquiries respecting them to thirty-three towns. In a summary of the answers supplied to him, he says:—

“In England, without exception, the day nurseries depend for their support upon private subscriptions. The average accommodation per nursery is for 30 infants, and ranges from 15 to 110, and the average attendance varies from 75 to 90 per cent. of the capacity of the nurseries, the ages at which the infants are eligible for admission being from three or four weeks, and for children up to five years. The staff of the nurseries of course depends upon the number of children received, and their age; but generally it is found that one nurse, with a young girl as assistant, can take charge of about 20 infants, and it is found that a nursery capable of receiving 50 infants will require a staff of matron, nurse and two girls.

“The nurseries are generally opened between 7 and 8 a.m., although in two cases the time of opening is as early as 5.30 a.m., and the children are fetched away between the hours of 6.30 and 8 p.m., the average stay being about 12 hours. The charges vary from 2*d.* to 4*d.* per day, and in most nurseries only half the usual charge is made for the children of widows and widowers, and a reduction is also made if more than one child from the same house attends the nursery. With about three exceptions the money

is paid day by day, either when the child is brought or when it is taken away from the nursery. At most of the nurseries clothing is not provided, only short pinafores, which are worn over their ordinary clothes. Provision is made for sleeping, by means of cradles for the younger, and cots for the older. In some of the institutions each child has its own particular cradle or cot. The children are expected to be brought in a cleanly state. In a few of the institutions each child is bathed daily. An examination is made of infants brought for admission, and in several of the nurseries a medical certificate of freedom from infectious diseases is required.

"The total cost of the nurseries varies from 2s. to 4s. per child per week, the average cost being about 3s. 3d.

"From the manner in which the nurseries are patronised it would appear that they fulfil a want, and it is beyond doubt that, at least while the infants are in the nurseries, they are well fed, cared for and kept in a cleanly condition."¹

The latest day nursery to be established in England is the Princess Christian Crèche at Hammersmith; this is in a district where over one thousand women are engaged in laundries, six hundred in incandescent-mantle works, and many in other industries.

This is to be open from 7.45 a.m. to 8 p.m. daily (Saturday until 3 p.m.), and the charges are: one child, 4d.; two children, 7d.; three, 10d.; and four, 1s. per day, if members of the same family.

The day nursery, or crèche, has met with a

¹ Special Report, by Dr. Moore, Huddersfield, 1904, pp. 27, 28.

great deal of criticism, and it would be well for us to consider what is to be said in its favour, and what are the objections to it.

Of the advantages which attend such an institution we may say :—

(1) It is undeniable that the employment of the women of the poorer classes away from home leads to neglect of their infants and children. The crèche affords care and attention for the latter during the absence of the mother.

(2) If under medical supervision, the crèche may be the means of detecting abnormalities in the children hitherto unnoticed, and of dealing with ailments in their early stages.

(3) It can be made a centre for instructing the mothers and young women. Dr. Kerr suggested some time ago that crèches should be used to teach the elder children in elementary schools the rudiments of infant management and feeding. The educational value of the crèche is advanced also by Dr. Niven, who suggests that for this purpose it should consist of a number of small rooms in which infants could be taken charge of, and a central hall in which demonstrations could be given. This establishment would be placed in the centre of the poorest districts and maintained at the public expense. It would be utilised for the training of teachers in the care of infants, and for the teaching of young mothers and nurses.

(4) The crèche would meet a need in being

an institution where infants wilfully neglected might be placed at the parents' expense.

The objections to such an institution are:—

(1) It is an additional incentive for the mothers to go out to work. Those who otherwise would remain at home might be inclined to undertake outside work, knowing that the crèche would take care of their children. This danger could, of course, be avoided by stringent rules of admission.

(2) It relieves the parents of a responsibility which they should bear, and, to an extent, undermines the mother's sense of duty to the child.

(3) It may become a centre for the spread of infectious diseases.

(4) The infant is exposed to great risks in being carried to and from the crèche in any kind of weather.

The crèche, if it is to be allowed to exist as a national institution, must be legally and medically supervised. This need has been recognised in France, its home.

Every facility should be afforded for breast feeding, and every attempt made to encourage this method of feeding, which is at the same time the natural and the safest one.

One important principle must be observed, namely, that the creche shall not undertake the care of infants without payment, and that the charges made will not be so small as to induce mothers to undertake employment when it is not necessary.

CHAPTER VIII.

THE ILLEGITIMATE INFANT.

THERE is a class of children which requires special attention at our hands, and if we recognise the truth of George W. Russell's dictum, "Citizenship is a trust confided to us, not only or chiefly for our own advantage, but for the benefit of those who are least able to help themselves," the illegitimate infants, if only on this score, demand our assistance.

The appearance of the illegitimate infant is without welcome ; it is not the joy of motherhood that greets him on his arrival. Hard as may be the suffering of the woman who is mother but not wife, it is the child's unhappy lot that must now concern us. It is not in his power to say yea or nay to his coming ; no blame should be attached to him ; he has an equal right to live and be healthy ; therefore it is a disgrace to civilisation that to-day, in our midst, the mortality rate of these unfortunate infants is double, treble, sometimes quadruple, that among those born in wedlock.

Dr. Farr, writing in the 38th Annual Report of

the Registrar-General, quotes from von Bernoulli to the following effect :—

“Who can doubt that their [illegitimate children] bringing up is much harder and more difficult; that the existence of a class of men bound to society by few or no family ties is not a matter of indifference to the State? It is beyond doubt that fewer illegitimate children grow up to maturity; that they get through the world with more trouble than the children born in wedlock; that more of them are poor; and that therefore more of them become criminals.”

Sufficient evidence has been advanced to prove that the mental and physical conditions of the mother during pregnancy have a most important influence upon the development of the child; this being so, are there not dire possibilities of ill for the illegitimate child?

Dr. Andriezen states that mental disorders in the mother follow illegitimate births twice as frequently as legitimate, and Dr. Clouston has stated that among the admissions to Morningside Asylum, Edinburgh, of those suffering from puerperal mania, 75 per cent. were instances of it following births out of wedlock.

The national stamina is weakened by the frequency of illegitimate children, the offspring of feeble-minded men and women.

A man with weak intellect as the father of seven—a feeble-minded woman the mother of eleven illegitimate children, another the mother of five, are alarming but by no means solitary records.

those having the higher rates during the last 23 years.

	Illegitimate Births to 1,000 Total Births.		
	1881-1890.	1891-1900.	1904.
Herefordshire . . .	76	69	64
Shropshire	82	70	67
Norfolk	72	64	62
Westmoreland . . .	70	61	68
Cumberland	76	68	59
Lincolnshire	58	55	53
Suffolk	57	55	50
Oxfordshire	53	52	57

A group with lower rates:—

Monmouth	40	31	26
Essex	33	29	27
Middlesex	34	30	29
Warwickshire . . .	41	34	32

There has been a marked decrease in the proportion of illegitimate births to total births in England and Wales during the last 30 years.

	Illegitimate Births to 1,000 Total Births.
1873	52
1883	48
1893	42
1903	39
1904	40

The figures in the above tables are only of value for crude comparisons as they depend upon

two variable factors; thus, a decline in the number of legitimate births, that of the illegitimate remaining the same, or an increase in the number of illegitimate births, that of the legitimate being unaltered, might determine an identical proportion.

But that there is a large decrease in the extent of illegitimacy is satisfactorily established from the following table, which gives the proportion of illegitimate births expressed as per 1,000 unmarried and widowed women of child-bearing ages—that is, 15 to 45 years.

1870-1872	.	.		17'0
1880-1882	.	.		14'1
1890-1892	.	.		10'5
1900-1902	.	.		8'5
1903	.	.		8'4
1904	.	.		8'4

This shows a reduction of over 50 per cent. during the last 30 years; the crude rate of the previous table shows a decrease of only 25 per cent.

The decrease in the illegitimate is much greater than is that of the legitimate birth rate during the same years. The figures in the following table are legitimate births expressed as proportions per 1,000 married women aged 15 to 45 years:—

1870-1872	.	.		292'5
1880-1882	.	.		286'0
1890-1892	.	.		263'8
1900-1902	.	.		235'5
1903	.	.		233'3
1904	.	.		229'1

There is a decline of 21·7 per cent. in the legitimate birth rate to compare with the 50 per cent. decline in the illegitimate.

But with all this reduction in the illegitimate birth rate, there were born out of wedlock in 1904 at least 37,674 infants,¹ a larger number than in any year since 1898. Expressed in another way, one in each twenty-six of the children born in England and Wales in 1904 was illegitimate.

We do not observe any constant relationship between the infant mortality (general) of a district and its rate of illegitimacy.² Thus Herefordshire in 1904 had a high proportion of illegitimate among her total births, 64 per 1,000; but the infantile mortality was 98 per 1,000 births. On the other hand, Monmouthshire, with the lowest rate of illegitimacy, 26 per 1,000 births, had an infantile mortality of 148. Shropshire had 67 illegitimate per 1,000 births, whereas the infantile mortality was 117.

We find as a general association that the counties having the highest rates of mortality among the infants have a low proportion of illegitimate births; at the same time, in every district we find the death rate among

¹ The writer says "at least," because in towns many illegitimate births are registered as legitimate; in rural districts it is not so easy to escape detection.

² "Rate of illegitimacy" refers to the official method of expressing illegitimate births as a proportion of 1,000 births.

illegitimate infants much greater than among the legitimate.

If we arrange the counties of England and Wales in two groups : an urban, which would include the counties with great industrial centres, and a rural, which would be comprised of those counties in which villages predominate, we find that each of the eight counties which we have included in the list of those with a large proportion of illegitimate births is in the rural group, and that the counties with highest rates of infantile mortality are all in the urban group. The high infantile mortality found in these counties is due to causes which are considered elsewhere, but there is no doubt that if there were less illegitimacy in the counties constituting the rural group, their general infantile mortality would be lower than it is.

We will now contrast in a rough manner the mortality of infants in Brighton, Norwich, and Plymouth in 1904, classifying them according to the legitimacy or otherwise of their birth.

	Brighton.	Norwich.	Plymouth.
Death rate of legitimate infants per 1,000 births	125	179'2	161'4
Death rate of illegitimate infants per 1,000 births	259	384	545'4

Dr. Tatham made an interesting investigation

for the year 1902 of the respective mortality in London and a group of rural counties of these two classes.¹

	London.				Rural Counties.			
	Males.		Females.		Males.		Females.	
	Leg.	Illeg.	Leg.	Illeg.	Leg.	Illeg.	Leg.	Illeg.
Infant death rate per 1,000 births . . .	151'2	289'3	118'7	264'1	125'6	190'2	98'8	166'1

The writer made an investigation of the respective rates of mortality among the Ipswich infants born in, and out of, wedlock.

Ten years' deaths were tabulated for this purpose.

During these years the average proportion of illegitimate to 1,000 births was 57, that of England and Wales for the same period being 41. The proportion of illegitimate births per 1,000 of the unmarried and widowed women, aged 15 to 45 years, may be taken as averaging 10'5, that of England and Wales during these years being 8'5.

The following table gives the number of infants that would die during each age period out of 100,000 born alive.

¹ Report of Inter-departmental Committee on Physical Deterioration, vol. i., p. 134.

Age Period.	Legitimate.	Illegitimate.
During the first two days . . .	1361	2609
„ first week . . .	2319	3915
„ first month . . .	4241	6288
„ second month . . .	1571	3559
„ third month . . .	1367	2372
„ fourth to sixth months .	2996	6166
„ seventh to ninth months	2506	3677
„ tenth to twelfth months.	1930	2135

We see that the higher death rate for the illegitimate infant persists throughout the first year. The fact of being born out of wedlock, with the attendant evils of baby farming and neglect, leads to a mortality which at some ages exceeds that of the legitimate born by over 125 per cent., and in some towns the excess is even very much greater. The conditions which are of moment in causing this greater mortality are in action before and after the birth. In one town the deaths from premature birth were more than twice as frequent among the infants born out of wedlock; and such causes of death as “inanition” and “debility from birth” were three times less frequent among the legitimate.¹

After birth, the illegitimate infant is unduly handicapped. The mother, if a factory hand or domestic servant, is usually intent upon returning to her employment as quickly as possible; to

¹ Still-births are not registered in England and Wales; therefore it is impossible to ascertain whether an undue number of illegitimate infants are dead at birth.

enable her to do this, she will either place the baby in a nurse home or leave it under the care of a woman for the day, looking after it herself during the evening and night, or entrust it to her relatives.

It is impossible to illustrate by mere words the terrible conditions under which much of this wreckage of humanity exists.

We hear of mothers paying to these nurses 1s., 1s. 6d., and 2s. a week to look after and feed their children !

We need not be surprised at the results; and there are to-day many illegitimate children under the friendless care of ignorant and heartless women who pursue a nefarious calling only too often untouched by the law. If the death of each illegitimate infant were to form the subject of a coroner's inquiry, some startling disclosures would be made. We hear from a northern city that recently a nurse woman had a record of four infant deaths in ten months.

What is the legal position of an unmarried mother and her child ? In England, if a child is born a day before marriage it is illegitimate, but if born a day after the marriage of its parents it is legitimate. In Scotland and in some of the Continental countries, a child born out of wedlock is legitimate, in the eye of the law, if the parents marry afterward.

What legal redress has the mother ? In England, under Acts of 1872 and 1873, the mother of a child born out of wedlock can

summon the putative father within twelve months of the birth, and justices may order the payment of expenses incident to the birth, and an allowance of 5s. per week until the child is sixteen years old.

There is no special legislation in England for the illegitimate child, but we may here consider two Acts whose purpose is to safeguard infant and child life.

The "Infant Life Protection Act, 1897," was passed with the idea of improving the conditions under which young children existed in "nurse homes," and to give legal protection to adopted children. Local authorities are expected to put this Act into execution. By this enactment it is required that any person "receiving for hire or reward more than one infant under the age of five years for the purpose of nursing or of maintaining such infants apart from their parents for longer than forty-eight hours" must notify the local authority to that effect; and the Act also requires that any person "receiving an infant under two years of age in consideration of a sum not exceeding 20*l.* paid down . . . to keep it till it is reclaimed, or able to provide for itself," must within forty-eight hours of receiving the child give notice of the fact to the local authority.

Furthermore, if an officer specially appointed by the local authority finds any such infants living in unfit premises, or in the hands of a person whose negligence and ignorance render her unfit

to have charge of them, he may remove them from such house. If the death of a child occurs when it is under the protection which this Act affords, the coroner must be notified within twenty-four hours.

Parents, grandparents, uncles and aunts, or those who would hold such relationship by "consanguinity or affinity" if it were legitimate, are exempt from the provisions of this Act.

It is to be noted that there is not any provision to enable surveillance to be exercised over those cases where only one child is taken to nurse however many may die under a particular woman's care, nor does the law require any report to the coroner when a death occurs in such a case. No control is exercised over relatives who undertake the charge of an illegitimate child, though, it is obvious, there is a grave necessity for this. Only too often we hear from the grandmother of an illegitimate child after its death: "Well, it is a blessing for my daughter that it is taken," or "Well, we could ill afford to keep it." Again, there is no provision in the Act for dealing with the women who take care of the infants during the day only.

In addition to the remedying of the above defects, we require legal provision to authorise the supervision and registration of lying-in homes, particularly those of a certain character to which unmarried women resort for childbirth and where the first step in baby farming is

generally taken. The owners of these homes should also be required to furnish the local authority with the names and addresses of the persons under whose care the children born in the homes are afterwards placed.

By the "Prevention of Cruelty to Children Act, 1904," it is determined that the neglect, ill-treatment, or abandoning of any child under the age of sixteen years by anyone over the age of sixteen who has charge of such, shall be considered a misdemeanour. If the child dies from this neglect, etc., and the person in charge had a monetary interest in the death, then the fine or sentence of imprisonment can be increased in severity.

Let us see what other lines of action we may adopt to better the condition of the illegitimate child; it is well for us to remember that "mortality statistics show us the dead, but are silent as to the maimed," and the conditions which cause the excessive mortality are so extreme in their character that few of the living pass through them scathless.

We require a more effective affiliation law. The Hon. C. K. Mackellar has compared the extent of illegitimacy in South Australia and New Zealand, where an effective Act has been in force for some time, with the metropolitan area of Sydney and the whole of the State of New South Wales, where there is not such provision; in the latter the proportion of illegiti-

macy—expressed per 1,000 births—is about double that in the former two colonies.¹ It is interesting to note in passing that the average infant mortality for the ten years 1895—1904 was 79·4 in New Zealand, and 107·9 per 1,000 births in New South Wales.

In Leipsic we find an intelligent interest taken in the illegitimate infant. The putative father is traced, his name is registered, and often he is prevailed upon to pay towards the child's maintenance. If the child is placed in the care of a person other than a relative, it immediately becomes a ward of the city. The municipality does not undertake any of the cost of maintaining: that devolves upon the parents. But the city exercises an oversight of the foster parents or those who take the child and of the child itself. Lady inspectors visit the homes to see if they are properly kept, if the children are well tended, their feeding bottles clean, and the milk sweet.

To conclude this brief account, prizes are annually given by the city to those women who can show their charges in the best condition, both of health and cleanliness.

Admirable results have followed this work in Leipsic, but a weak point in their system is that before the city exercises her wardship the child must be separated from its mother. Now, next to the care of the child, the great aim of any system should be to arouse the mother's love for her

¹ *British Medical Journal*, 1904, vol. i., p. 683.

offspring. Arouse this love, and the greatest step has been taken in preventing the mother's second fall. But part the mother from her child, particularly in those early days when its very helplessness should appeal, and we are losing our best chance. Separation also implies that the child is not fed on its mother's milk; this again we should avoid for reasons that we have considered elsewhere.

To go abroad once more, we have an interesting object lesson in Villiers-le-Duc, where we find that in the regulations drawn up with the purpose of "preventing mortality at birth and children being still-born" it is specifically declared that the unmarried women when pregnant—equally with the married—shall, if necessary, receive communal aid. Skilled attendance at the birth is ensured, and the welfare of the illegitimate infant is considered equally with the legitimate.

The time is certainly at hand for maternity charities, whether purely social in their founding, or even more if with a religious foundation, to recognise the need of aiding the unfortunate woman who has not a legal husband, and the infant who has not a legal father. Whatever the fault of the mother, are we justified in allowing an infant unusual chances of suffering?

On no ground can such action be supported. If humane feelings—and they should be sufficient—cannot effect a change, may we make an appeal on the ground of public economy? Discourage

illegitimacy by making the father suffer more equally with the mother; but it is not done by allowing the infants to die at an unnatural rate, nor by our passive position, which only means unnecessary suffering for our innocent, helpless citizens.

APPENDIX.

THE writer's experience suggests that action would be taken more widely for the purpose of lessening the mortality and sufferings of infants were it not that the opinion is so general that the institutions necessary for such endeavours are costly, and require for their continuance such special conditions that only municipalities or wealthy societies could be responsible for them. But in many a small town in our country a saving work could be done with as great ease as the maintenance of a "soup kitchen," a very common institution. To the ordinary voluntary workers, it requires but the addition of a medical man, and a "milk dispensary" could be carried on without great difficulties. Thus might be inaugurated a movement of great importance.

M. Morel de Villiers has sent to the author an article of his entitled "*Du rôle de la Femme dans les Œuvres de Puériculture*," and as there is much in this which supports the above contention, a perusal of the following extract may be of value:—

"In villages and small towns, where the resources are limited, one often hesitates to begin a '*Goutte de Lait*'; one fears the expense, the responsibilities, and the anxieties. This hesitation is unnecessary, and if one appeals to the inexhaustible devotion of woman, all fears disappear as if by magic. When we started our '*Goutte de Lait*' in Dijon, we only possessed the desire to do good, which, from a material point of view, was insufficient. But premises were placed at our disposal, and we bought a saucepan, a few

feeding bottles, and some baskets, and we had a kitchen stove lent to us.

"We received our milk from a neighbouring farm, we assured ourselves that the cows were healthy and well nourished, and that they produced good milk.

"Then we said to some ladies, 'Come and help us.' They came, and great success has attended their efforts.

"We do not try to make the work a charity; we sell the milk, very cheaply to the poor mothers, but at a higher rate to those who can afford it.

"Then, as our income increased and contributions were sent, we were able to extend our operations.

"Our Dijon organisation has yet another object in view, for if it were only the question of supplying good milk, any conscientious person might undertake the work. This other object is to create a school, to instruct mothers and social workers in the principles which underlie the saving of life among our little ones.

"This is our order of work:

"7.30 a.m.—The milk is brought to us in hermetically-sealed vessels. The housekeeper arranges the feeding bottles, baskets, etc., on the tables.

"8 a.m.—The ladies arrive, put on their aprons, and take their places at the tables on which are found the diet sheets. There is a special diet sheet for each child, which indicates the modification required and the amount to be given at each feeding. Each basket contains sufficient milk in bottles to last twenty-four hours.

"After this is concluded, most of the workers leave, two or three remain to distribute the baskets to the mothers, to enquire after the babies, and to answer any necessary questions.

"In the afternoon the housekeeper washes the feeding bottles which were brought back in the morning.

"One of the 'Goutte de Lait' doctors attends each day to examine the babies, and to write out the diet

for each of them. Our workers can attend the consultations, and thus they profit by the advice given to the mothers of the babies.

"The doctors have only to instruct woman in a few scientific details, and then let her maternal instincts act.

"At Dijon we seek to practise only simple methods. We advocate natural feeding, but if it is impossible for the mother to nurse, or if the baby is already weaned, we are then in the presence of an irremediable condition, and all we can do is to give the little one good new milk, properly modified.

"The ladies of the 'Goutte de Lait' not only help us in the way I have mentioned, but they visit the homes and instruct the mothers in accordance with our teaching, and probably with a greater success than would attend our direct efforts, as they have innate powers of persuasion greater than we.

"I want to draw your attention to the fact that in small towns, and even in villages—where it is always possible to find some devoted women—this work of 'puericulture' may be started and carried on almost free of expense."

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